

**The Role of State and Non-state Actors
in the Management of the
Patagonian Toothfish
(*Dissostichus eleginoides*)**



The Patagonian toothfish © CSIRO Marine Research

Volume 1

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Statement of Authenticity

This dissertation contains no material which has been accepted for the award of any other higher degree or graduate diploma in any tertiary institution. To the best of my knowledge and belief, this study contains no material previously published or written by another person, except where due reference is made in the text of this dissertation.

A handwritten signature in black ink, reading "Liza Fallon". The signature is stylized with a large, sweeping loop on the left side of the first name and a horizontal line extending from the end of the last name.

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Liza Danielle Fallon

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Abstract

The deep-sea Patagonian toothfish (*Dissostichus eleginoides*) fishery rapidly expanded in the 1990s across the Southern Ocean. This species is now heavily exploited in some regions, and commercial extinction of some stock under the highest pressure has already occurred. Much of the pressure on this stock derives from illegal, unreported and unregulated (IUU) fishing, which also profoundly undermines fisheries management by coastal States and the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR). It also brings into question the capacity of international actor-networks to manage the stocks in a sustainable manner and discipline dissident actor-networks that target the resource.

Issues of international geopolitics, global governance, power and hegemonies, ecosystem fisheries management and nature conservation are investigated. This is because they are increasingly important to the current attempts by CCAMLR members, national governments, scientists, licensed fishers, non-governmental organisations (NGOs) and the general public to manage Patagonian toothfish stocks, grapple with IUU fishing and conserve this important but poorly understood fishery. I use a qualitative approach in which I draw upon insights from actor-network theory (ANT) to illustrate descriptively how human, nonhuman and inhuman actors exert power and influence each another in a complex, heterogeneous and dynamic actor-network. To help construct the *Patagonian Toothfish Network*, I refer to documentary research, and 70 in-depth, semi-structured key informant interviews and participant observations at Australian and CCAMLR fisheries management fora that were undertaken between 2002 and 2006.

I found that IUU fishers threaten the stability of the *Patagonian Toothfish Network* when they act in a dissident manner and continue to target the stocks in contravention to legal and moral norms. State actors seeking to manage and conserve the fishery and stop IUU fishing activities exert power from a distance using cooperative and putative measures. They aim to encourage IUU fishers and their associates to modify their behaviour by acting on their own conduct and complying with normative beliefs, institutional principles, policies and practises. In addition, non-state actors have arguably played a very constructive role in broadening effective action to stop IUU fishing. However, they have not solved the problem in their own right and it is through the combined actions of CCAMLR and its members, concerned fishing States, and licensed fishers, together with the associations they have formed, that have led to developing new ways to manage and conserve the fishery. Whether the focus is on managing and conserving the Patagonian toothfish fishery, other global fisheries or the global ecosystem, this investigation reveals that the key to sustainability appears to rest with building a more inclusive actor-network. In such an actor-network, individuals are connected with one another and encouraged to monitor their own behaviour and risks to cooperatively share resources for the collective good.

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Acronyms and Abbreviations

AAD	Australian Antarctic Division
ABARE	Australian Bureau of Agricultural and Resource Economics
ABC	Australian Broadcasting Commission
ACAP	Agreement for the Conservation of Albatrosses and Petrels
ACS	Australian Customs Service
AFF	Asian Fisheries Federation
AFFA	Agriculture, Fisheries and Forestry (Australia)
AFMA	Australian Fisheries Management Authority
AFV	Australian Fishing Vessel
AFZ	Australian Fishing Zone
AMLR Act	<i>Antarctic Marine Living Resources Conservation Act 1981</i> (Australia)
AMSA	Australian Maritime Safety Authority
ANC	African National Congress
ANT	Actor-network Theory
AQIS	Australian Quarantine Inspection Service
ASDA	American Seafood Distributors Association
ASIC	Australian Seafood Industry Council
ASMA	Antarctic Specially Managed Area
ASOC	Antarctic and Southern Ocean Coalition
ATCM	Antarctic Treaty Consultative Meeting
ATCP	Antarctic Treaty Consultative Party
ATS	Antarctic Treaty System
BAS	British Antarctic Survey
BIOMASS	Biological Investigation of Antarctic Systems and Stocks
Birdlife Inter.	Birdlife International
BOI	Blue Ocean Institute
BRS	Bureau of Rural Sciences (Australia)
CAFF	Agreed Measures for the Conservation of Antarctic Fauna and Flora (1964)
CAMLR Convention	Conservation of Antarctic Marine Living Resources Convention (1981)
CASAL	C++ Algorithmic Stock Assessment Laboratory Model
CBD	Convention on Biological Diversity
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CCAS	Convention on the Conservation of Antarctic Seals (1972)
CCF	CCAMLR Consultative Forum (Australia)
CCRF	Code of Conduct for Responsible Fisheries (of the Food and Agriculture Organisation)
CCSBT	Convention for the Conservation of Southern Bluefin Tuna Commission
CDQ	Community Development Quota
CDS	Catch Documentation Scheme
CEP	Committee for Environmental Protection
CFP	Common Fisheries Policy
CFSI	California Fisheries and Seafood Institute
CFZ	Common Fishing Zone (Argentina and Uruguay)
CIA	Central Intelligence Agency
CIAM	Coastwatch Intelligence Analyst Meeting (Australia)

CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS	Convention on Migratory Species of Wild Animals
COLTO	Coalition of Legal Toothfish Operators
Compliance Agreement	Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (of the Food and Agriculture Organisation)
COP	Conference of the Parties
CPI	Comité de Pilotage de l'Industrie (La Réunion Islands)
CPOA-IUU	CCAMLR Plan of Action on Illegal, Unreported and Unregulated Fishing
CPPS	Commission on the South Pacific
CRAMRA	Convention on the Regulation of Antarctic Mineral Resource Activities (1988)
CSIRO	Commonwealth Scientific and Industrial Research Organisation (Australia)
CTE	Committee on Trade and Environment (of the World Trade Organisation)
CTMFM	Comisión Técnica Mixta del Frente Marítimo
cVMS	Centralised Vessel Monitoring System
CWCA	China Wildlife Conservation Association
DAFF	Department of Agriculture, Fisheries and Forestry (Australia)
DEH	Department for Environment and Heritage (Australia)
DFAT	Department of Foreign Affairs and Trade (Australia)
DINARA	Dirección Nacional de Recursos Acuáticos (Uruguayan Fisheries Institute)
DOC	Department of Conservation (New Zealand)
DPI	Department of Public Information (of the United Nations)
DPIWE	Department of Primary Industry, Water and Environment (Tasmania, Australia)
DSB	Dispute Settlement Body (of the World Trade Organisation)
DSCC	Deep Sea Conservation Coalition
EAF	Ecosystem approach to fisheries
eCDS	Electronic Catch Documentation Scheme
ECOSOC	Economic and Social Council (of the United Nations)
EEZ	Exclusive Economic Zone
EFPP	Extraordinary Fishing Permit
EIA	Environmental Impact Assessment
ENGO	Environmental Non-governmental Organisation
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Australia)
ESD	Ecologically Sustainable Development
EU	European Union
FAO	Food and Agriculture Organisation (of the United Nations)
FFA	Forum Fisheries Agency
FICZ	Falkland Islands Inner Conservation and Management Zone
FIS	Fish Information and Services
FMNH	Florida Museum of Natural History
FOC	Flags of Convenience
FOCZ	Falkland Islands Outer Conservation Zone
FOE	Friends of the Earth
FONC	Flags of Non-compliance
FRDC	Fisheries Research and Development Corporation (Australia)
FSU	Fish Stock Unit
GATT	General Agreement on Tariffs and Trade
GFMO	Global Fisheries Management Organisation

GSGSSI	Government of South Georgia and the South Sandwich Islands
GYM	Generalised Yield Model
HBFI	Hout Bay Fishing Industries Pty Ltd
HIMI	Heard Island and McDonald Islands
HIMIEEZ	Heard and McDonald Islands Exclusive Economic Zone
HSI	Humane Society International
HSREG	High Seas Vessel Registration System
IABO	International Association of Biological Oceanography
IATTC	Inter-American Tropical Tuna Commission
ICCAT	International Commission for the Conservation of Atlantic Tunas
ICES	International Council for the Exploration of the Sea
ICFA	International Coalition of Fisheries Associations
ICJ	International Court of Justice (World Court of the United Nations)
ICSU	International Council of Scientific Unions
IGO	International Government Organisation
IGY	International Geophysical Year
IMO	International Maritime Organisation
INDNR/IUU	International Conference on Illegal, Unreported and Unregulated Fishing
INGO	Industry Non-governmental Organisation
INTQ	Individual Non-transferable Quota
IOC	Intergovernmental Oceanographic Commission
IPOA	International Plan of Action
IPOA-Capacity	International Plan of Action for the Management of Fishing Capacity (of the Food and Agriculture Organisation)
IPOA-IUU	International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (of the Food and Agriculture Organisation)
IPOA-Seabirds	International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries (of the Food and Agriculture Organisation)
ISO	International Standards Organisation
ISOFISH	International Southern Oceans Longline Fisheries Information Clearing House
ITLOS	International Tribunal for the Law of the Sea of the United Nations
ITQ	Individual Transferable Quota
IUCN	International Union for the Conservation of Nature (now the World Conservation Union)
IUU	Illegal, unreported and unregulated
IW	Integrated Autoline Weighted
IWC	International Whaling Commission
KYM	Krill Yield Model
LME	Large marine ecosystem
LOSC	Law of the Sea Convention (of the United Nations)
Madrid Protocol	Protocol on Environmental Protection to the Antarctic Treaty (1991)
MAPA	Ministerio de Agricultura, Pesca y Alimentación (Spain)
MARPOL 73/78	International Convention for the Prevention of Pollution of Ships
MBA	Monterey Bay Aquarium
MCA	Marine Conservation Alliance
MCS	Monitoring, control and surveillance
MCS Network	International Network for the Cooperation and Coordination of Fisheries Related Monitoring, Control and Surveillance
MEA	Multilateral Environmental Agreement (of the World Trade Organisation)

Mercosur	Mercado Común del Sur/Southern Common Market
MPA Taskforce	Marine Protected Areas Task Force (Australia)
MPA	Marine Protected Area
MRAG	Marine Resources Assessment Group Ltd
MSC	Marine Stewardship Council
MSY	Maximum Sustainable Yield
mt	Metric Tonne
NAFO	Northwest Atlantic Fisheries Organisation
NEAFC	North East Atlantic Fisheries Commission
NET	National Environmental Trust
NGO	Non-governmental Organisation
NMFS	National Marine Fisheries Service (United States)
NOAA	National Oceanic and Atmosphere Administration (United States)
NOO	National Oceans Office (Australia)
NPFMC	North Pacific Fishery Management Council
NPOA-IUU	National Plan of Action to Prevent, Deter and Eliminate IUU Fishing (Australia)
OECD	Organisation for Economic Cooperation and Development
OPP	Obligatory Passage Point
OTHR	Over the Horizon Radar
PEMI	Prince Edward and Marion Islands
QMS	Quota Management System
RAN	Royal Australian Navy
REIO	Regional Economic Integration Organisation
RFMO	Regional Fishery Management Organisation
SAFAG	Subantarctic Fisheries Assessment Group (now SARAG)
SAGPyA	Ministerio de Economía, Secretaría de Agricultura, Ganadería Pesca y Alimentación (Argentina)
SARAG	Subantarctic Resource Assessment Group (formally SAFAG)
SARPC	Syndicat des Armements Réunionnais de Palangriers-Congélateurs
SCAF	Standing Committee on Administration and Finance (CCAMLR)
SCAR	Scientific Committee for Antarctic Research
SC-CCAMLR	Scientific Advisory Committee (CCAMLR)
SCIC	Standing Committee on Implementation and Compliance (CCAMLR)
SCOR	Scientific Committee on Oceanic Research
SEAFO	South East Atlantic Fisheries Organisation
SFR	Statutory Fishing Right
SGSSI	South Georgia and South Sandwich Islands
SGSSIMZ	South Georgia and South Sandwich Islands Maritime Zone
SSRU	Small Scale Research Unit
SoFIA	State of World Fisheries and Aquaculture
SOLAS	Safety of Life at Sea Convention (SOLAS 74)
SouthMAC	Subantarctic Fisheries Management Advisory Committee (Australia)
SPC	Secretariat of the Pacific Community
SSN	Species Survival Network
SSS	Southern Seabird Solutions
SUDEPPU	Sindicato Único de Patrones Pesqueros del Uruguay
SUNTMA	Sindicato Único Nacional de Trabajadores del Mar y Ramas Afines
TAC	Total Allowable Catch
TAAF	Territoire des Terres Australes et Antarctiques Françaises (France)

TCT	Tasmanian Conservation Trust
TRAFFIC	Trade Records Analysis of Flora and Fauna in International Commerce
TRIPS	Trade-Related Aspects of Intellectual Property Rights (of the World Trade Organisation)
UIA	Union of International Associations
UK	United Kingdom
UN	United Nations
UNEP	United Nations Environment Program
UN Fish Stocks Agreement	The Agreement for the Implementation of the Provisions of LOSC relating to the Conservation and Management of High Seas Straddling Fish Stocks and Highly Migratory Fish Stocks (the Fish Stocks Agreement of the United Nations)
UIA	Union of International Associations
UNICPOLOS	United Nations Open-Ended Informal Consultative Process on Oceans and the Law of the Sea
USA	United States of America
UTAS	University of Tasmania (Australia)
Valdivia Group	Group of Temperate Southern Hemisphere Countries on the Environment
VMS	Vessel Monitoring System
WCO	World Customs Organisation
WCPFC	Western and Central Pacific Fisheries Convention
WDCS	Whale and Dolphin Conservation Society
WG-EMM	Working Group on Ecosystem Monitoring and Management (CCAMLR)
WG-FSA	Working Group on Fish Stock Assessment (CCAMLR)
WG-IMALF	Working Group on Incidental Mortality Arising from Longline Fisheries (CCAMLR)
WHA	World Heritage Area
WSSD	World Summit on Sustainable Development
WTO	World Trade Organisation
WWF	World Wildlife Fund
WWW	World Wide Web (Internet)

Chapter 1

The Patagonian Toothfish

1.1 Introduction

Patagonian toothfish (*Dissostichus eleginoides*) is a trans-boundary,¹ long-lived, deep-sea fish that is found in the Southern Ocean. It is the most important international deep-sea fishery in these waters that has been targeted by commercial fishers since the late-1980s. So valuable has it become that it is known as *white gold* and sought after by high-class restaurateurs in the main markets of the United States, Japan and Europe. However, this fish now fetches such high prices that it is over-fished in some fishing grounds and a significant *black market* now thrives. Known as illegal, unreported and unregulated (IUU) fishing, these black market activities are driven by cultural and social norms, power, money and greed. IUU fishing has become so prolific that it has developed into a highly organised trans-national crime that accounts for over a third of all Patagonian toothfish landed (see, for example: Agnew 2000; AAD 2005d; CCAMLR 2005b; FAO 2000; HSTF 2006; Trent *et al.* 2005).

IUU fishing challenges the ecological viability of the Patagonian toothfish, and the economic viability of legitimately licensed toothfish fishers (hereafter licensed fishers). Since the early-1990s, numerous regulatory measures aimed at combating IUU fishing in the Patagonian toothfish fishery have been developed by state actors at various spatial scales. Most of these measures are captured in a net of instruments that fall within the legal sphere of the Law of the Sea Convention (LOSC) at the global level, and fisheries management and conservation arrangements implemented by the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) at the regional level and State governments at the national level. However, IUU fishers have successfully resisted regulatory measures and their activities arguably continue to compromise the efforts of CCAMLR and its members, national governments and various international government organisations (IGOs) to manage and conserve Patagonian toothfish stocks (see, for example: Kirkwood & Agnew 2004; Molenaar 2003; OECD 2004a; Stokke & Vidas 2004; Vidas 2004; 2000). In particular, CCAMLR and its members have been widely criticised by a range of state and non-state actors including scientists, licensed fishers, representatives from various non-governmental organisations (NGOs) and some government officials for being unable to stop IUU fishing and associated environmental impacts upon non-target bycatch species and the ecosystem (for example: the incidental hooking of *environmentally-valued* species such as seabirds on longlines).

¹ Trans-boundary fish stocks can be highly migratory or straddling and cross national maritime boundaries into other national maritime boundaries and/or the adjacent high seas (Miller & Munro 2002; Munro *et al.* 2004).

I draw on Vidas (2004) and Stokke and Vidas (2004), who argue that the main thrust of present regulatory measures to combat IUU fishing focus on *curing the symptoms* of IUU fishing rather than understanding or addressing the causes, and deal with manifestations of the problem rather than the purposes of those who created it. I contend that IUU fishing *per se* is only part of the problem that centres on how to manage the Patagonian toothfish fishery in a sustainable manner; and a deeper understanding about how and why IUU fishing occurs is needed if current outcomes for the fishery are to be improved. In this vein, Vidas (2004) and Stokke and Vidas (2004) suggest that IUU fishing is part of an inter-related chain that links a wide range of actors. Therefore, in order to expose and understand IUU fishing, I describe various links in the Patagonian toothfish management and conservation chain in an effort to understand how the nodes created by IUU fishing impact upon the entire actor-network.

My intention here is to document the influence that state and non-state actors exert on governments and signatories to CCAMLR, the Patagonian toothfish fishing industry, and the international community in an effort to and manage and conserve Patagonian toothfish stocks, protect *environmentally-valued* species and combat IUU fishing. I do not attempt to develop new measures to stop IUU fishing, but describe a range of actor-networks engaged in the management and conservation debate in an effort to make visible areas for improvements. I question if networking across state and non-state spheres and shifting responsibilities from the state to the non-state actors have emerged, and if so, has such networking led to new forms of governance in Patagonian toothfish management and conservation fora.

Specific to one fishery, this investigation applies to other contexts in which state and non-state actors must deal with IUU fishing and protect commercial fish stocks, and it contributes to important debates about the changing characteristics of international geopolitics, global governance, ecosystem fisheries management and nature conservation (see, for example: Arts 2004; Cole 2003; Eckerberg & Joas 2004; Friedheim 1999; Murphy 2005; Stokke 1999). I reflect on the space of international action to combat IUU fishing of the Patagonian toothfish and focus on power and hegemonies and the values and actions in response to addressing such a challenge. In short, although this study investigates one fish stock that is under pressure in very unique circumstances, it is significant because it provides an excellent example of a common fishery problem of international significance.

I begin by highlighting global concerns about diminishing fish stocks that result from over-fishing, excess fishing capacity and IUU fishing. I then explain that competition for declining fish stocks in the northern hemisphere have, in part, contributed to fishers re-locating to the southern hemisphere and targeting commercially productive fisheries such as the Patagonian toothfish fishery. It is against this backdrop that I explore in detail how a heterogenous range of actor-networks in a complex and dynamic *Patagonian Toothfish Network* have sought to manage and conserve this fishery with

mixed success. In light of the foregoing, the defensible proposition put forward is that under some circumstances, non-state actors can be a decisive influence forcing change upon state actors acting together to manage an international fishery. This proposition will be addressed via the following research questions:

1. What can be gained by using actor-network theory (ANT) to investigate the role of state and non-state actors in the management of the Patagonian toothfish?
2. How might the interpretive lens of ANT make the *Patagonian Toothfish Network* visible?
3. Does the influence of the actor-networks change when the configurations of the *Patagonian Toothfish Network* are reconstructed?
4. How does IUU fishing manifest in the *Patagonian Toothfish Network*, and what sorts of effects does it have on the actor-network and those attempting to define, create and maintain ecological, moral and legal norms?
5. What lessons may be derived from the analysis of this actor-network in terms of theory, policy and practice?

The conceptual framework is illustrated in Figure 1.1. Triangulation² (including multiple methods, multiple data sources and various inscriptions)³ is used to examine how the Patagonian toothfish is able to focus a range of actor-networks to form a complex socio-natural-material *Patagonian Toothfish Network*. Here, I needed to integrate multiple methods to ensure that the argument and analysis derived from multiple data sources are integrated intellectually. As such, I considered the potential difficulties of integrating multiple data sources at the initial research design phase and allowed for the creative assimilation of multiple data sources within a systematic framework. I used multiple methods that include theory development, documentary analysis, interviewing and participant observations to cross-check findings. A comprehensive review of the literature was conducted to examine methodological approaches and issues relevant to the Patagonian toothfish. Seventy qualitative in-depth, semi-structured, open-ended, key informant interviews with state and non-state actors involved in the harvesting, management and conservation of the Patagonian toothfish were then conducted to validate, refute or add to the literature review findings. I was a participant observer at CCAMLR meetings, Australian fishery management meetings, and other fora in order to improve my understandings of the internal workings of the Convention on the Conservation of Antarctic Marine Living Resources at the diplomatic level and Australian Government management arrangements at the domestic level.

² Triangulation helps to ensure research rigour and trustworthiness (Mason 2002) and reduces the deficiencies of any one methodology or method (Blaike 1988; Minichiello *et al.* 1995; Campbell & Fiske 1959). Denzin (1978: 291) broadly defines triangulation as “the combination of methodologies in the study of the same phenomenon”, and argues that by combining theories, methods, investigators and sources, rich and powerful interpretations result.

³ ‘Inscriptions’ are literary and/or visual forms ascribed to data and information.

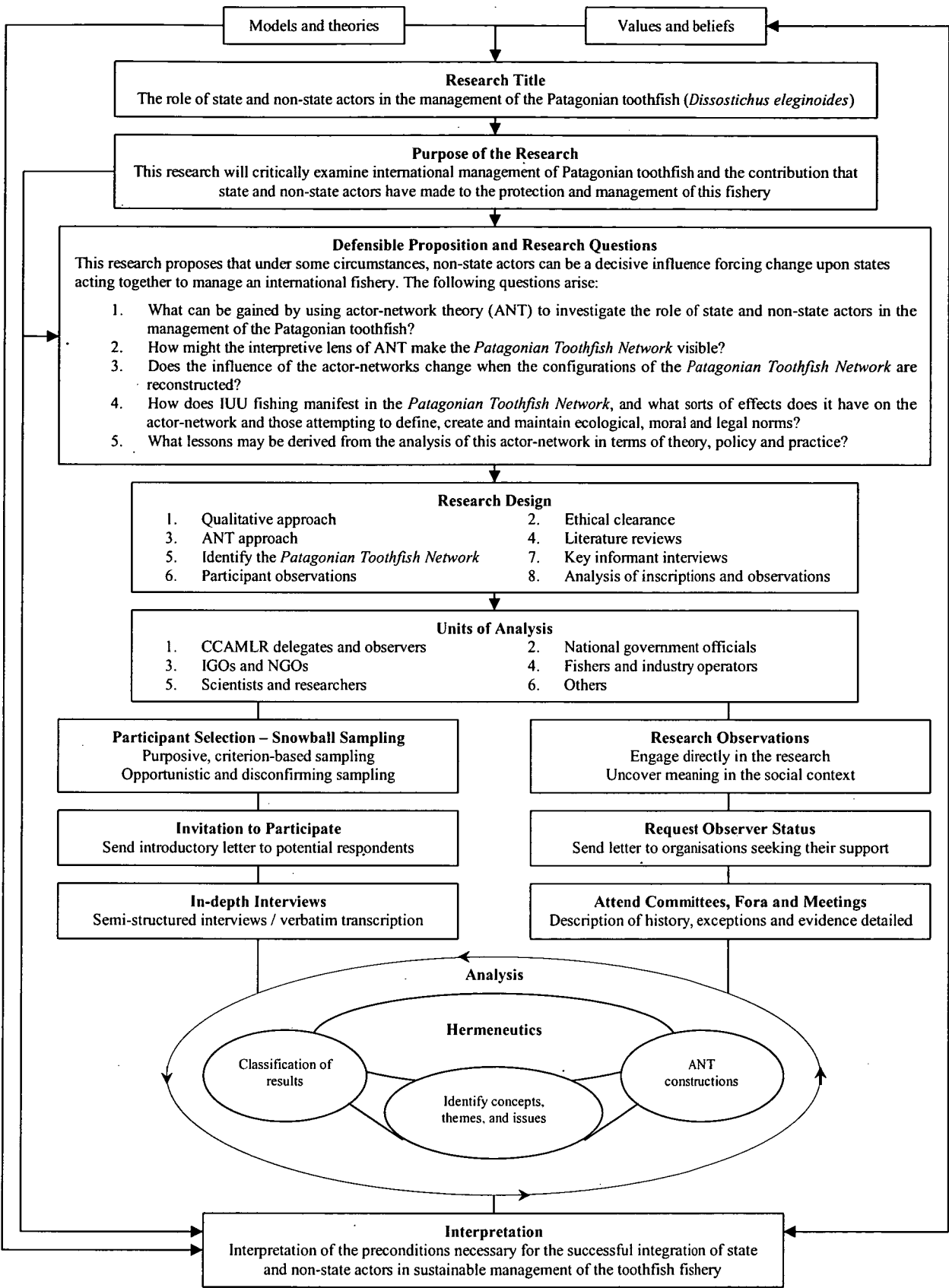


Figure 1.1: Conceptual framework of the research process and analysis

1.2 Global fish stocks under pressure

There has been a sharp rise in fishing over the last 50 years, both licensed and illegal, and it has placed considerable pressure on the overall state of global fish stocks. In November 1995, the second Conference of Parties (COP/2) on the Convention of Biological Diversity (CBD) called for urgent action to conserve marine and coastal ecosystems. The resultant Jakarta Mandate on Marine and Coastal Biological Diversity recognised that the “biological diversity that comprises variability of genes, species and ecosystems is the world’s most valuable resource for the sustainability and welfare of all humankind” (COP/2 1995: 1).

Despite the importance of marine and coastal ecosystems, all the world’s current fishing grounds are being over-exploited or fully utilised at or above their sustainable limits (Kirkley & Squires 1999; Schorr 2004). In 1996, the Food and Agriculture Organisation (FAO) reported that nearly 60 per cent of the world’s major fisheries are either mature or senescent (FAO 1996). In the *State of World Fisheries and Aquaculture* (SoFIA) reports from 2000 and 2004, the FAO states that approximately 47 per cent of the global fish stocks are fully exploited, over 27 per cent are either over-exploited or depleted and only five per cent appears to be recovering or under-exploited (Figure 1.3). In addition, production levels from 12 of the FAO’s 16 world fishing regions have fallen below their historical maxima.

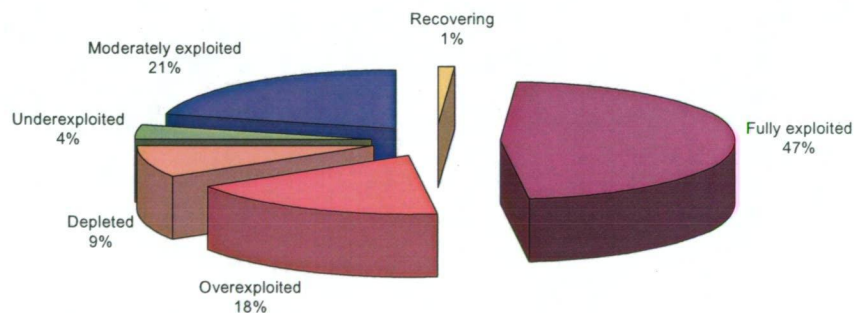


Figure 1.2: State of the world’s fish stocks (Adapted from: FAO 2000; 2004c)

Fisheries have rarely been sustainable (Pauly *et al.* 2002). Rather, fishing has induced serial depletions that are masked by improved technology, geographic expansion and the subsequent exploitation of previously unfished species. Notably, Myers and Worm (2003) have estimated the global rates of decline for large predatory fishes in four continental shelf and nine oceanic systems, including the narrow shelf area around South Georgia in the Southern Ocean. They conclude that the world’s oceans have lost more than 90 per cent of large predatory fishes and that the decline in number of these fish in coastal regions has extended throughout the world oceans, jeopardising ecosystems. They explain that most new fisheries show very high catch rates, and that commercial fishers reduce community biomass by up to 80 per cent within 15 years of commercial exploitation. Yet, management schemes are usually implemented well after

commercial fishing has begun and only serve to *stabilise* fish biomass at low levels (up to 10 per cent of the original numbers). Given these factors and considering that global fish catches have declined since the 1980s, a continuation of present trends will lead to supply shortfalls, “for which aquaculture cannot be expected to compensate, and may well exacerbate” (Pauly *et al.* 2002: 689). These findings confirm that global fish stocks are under pressure, that large predatory fishes are highly sought after, and that the management of global fish stocks is failing to ensure their long-term sustainability.

1.2.1 Law of the Sea

LOSC was signed in 1982 and establishes principles, general objectives and a comprehensive framework for use and development of the world’s oceans (Kimball 2003; Nandan 1999).⁴ This Convention was designed to serve as a unifying framework for the growing number of international agreements on marine environmental protection and the management and conservation of marine living resources (Tsamenyi & McIlgorm 1995).⁵ It governs activities on land and at-sea, and calls on all States to develop global and regional rules and harmonise national measures (LOSC 1982).⁶ LOSC also sets out the sovereign maritime rights and obligations of coastal States and the rights and obligations of other States in these maritime zones, and the rights and obligations of all States in maritime spaces beyond national jurisdiction (for example: all States have the same rights and obligations with regard to the high seas and international seabed) including navigation provisions, passage of ships, and international dispute and settlements procedures (García 2004).⁷ In particular, coastal

⁴ LOSC was negotiated between 1973 and 1982 by participants to the third UN LOSC Conference (LOSC 3). It was signed by 117 States, became legally binding in 1994 and is considered a success due to its general acceptance by States (Nandan 1999). The League of Nations convened in The Hague in 1930 to codify international law, but participants were unable to reach agreement on the width of territorial waters. In 1945, the United States Government proclaimed its intention to create extended conservation zones adjacent to the United States coast to manage fishing (Belsky 1986). Although the zones were not created, precedent was set. In the 1950s and 1960s, Latin American States claimed a 200 nautical mile zone off their coasts and Norway and Iceland claimed territorial waters to four nautical miles (Sahrhage & Lundbeck 1992). Participants to LOSC 1 in 1958 adopted the Convention on Fishing and Conservation of the Living Resources of the Sea, the precursor to LOSC (Birnie & Boyle 1992).

⁵ Here, ‘environmental protection’ is defined as saving natural resources from human consumption, thus precluding their use. The concept of environmental protection emerged in the United States with the first national park being declared in 1872; with Royal Park in Australia in 1879; and in 1885 in Canada with Banff Park and Niagara Falls (see Bromley 1997; Eagles 1997; National Park Service 2006).

⁶ A ‘State’ is an independent political community possessing a government and asserting sovereignty over a defined territory and population.

⁷ Sovereignty was defined by Jean Bodin in 1577 as “the absolute and perpetual power of a commonwealth” (Bodin 1577 in Franklin 1992: 1), and redefined by F. H. Hinsley (1986: 25-26), as the “final and absolute authority in the political community.” More recently, it has been defined as political, military, administrative and jurisdictional control over a given territory (see Cole 2003; Dean 1999; Kaimieniecki & Scully Granzeier 1998; Wapner 1998), and as the bedrock principle underlying the Westphalian system of mutual rights and responsibilities that recognise autonomous States with sole and final authority over a delimited territorial space (Darby 1994; Deudney 1998). Only the State formulates foreign policy using international law, and environmental treaties and agreements to fortify and reproduce sovereignty (Litfin 1988). However, the Westphalian system is contested in both practice and theory as a major impediment to international problem solving (see Brahm 2005). Sovereignty is also uncertain because it is socially constructed whereby punitive States convert power into authority and other States accept the institutional structure (Litfin 1988).

States have substantial authority over activities in their national maritime waters including fishing activities, but the degree of control they exercise over use by other States varies with the zone and activity in question (LOSC 1982 Articles 3, 33, 56 and 76). National maritime zones are illustrated in Figure 1.3 and include:

- **internal waters** that form part of a coastal State's territory and normally includes estuaries, ports, and rivers and bays up to a certain size;
- **a territorial sea** of up to 12 nautical miles (nm) from the baseline, where coastal States exercise sovereignty subject to the right of foreign vessels to innocent passage;
- **a contiguous zone** adjacent to the territorial sea up to 24 nautical miles from the baseline, where coastal States exercise control necessary to prevent and penalise any infringement of its sovereignty within its territory or territorial sea;
- **an exclusive economic zone (EEZ)** beyond and adjacent to the territorial sea which extends to 200 nautical miles, where coastal States exercise sovereign rights over natural resources and other economic uses and jurisdiction; and
- **the continental shelf** comprises the seabed and subsoil that extends beyond the outer limit of the territorial sea to the outer edge of the continental margin, or to a distance of 200 nautical miles, but not beyond 350 nautical miles, where the outer edge of the continental margin does not extend up to that distance – here, coastal States exercise sovereign rights over natural resources and jurisdiction over marine scientific research.

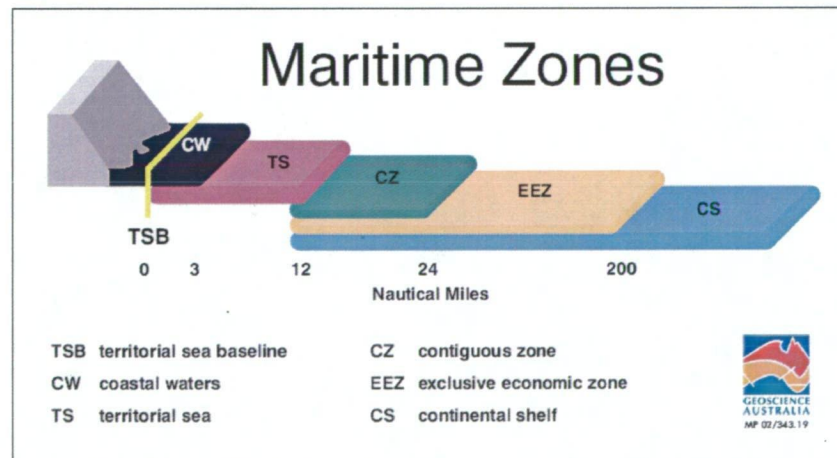


Figure 1.3: Maritime zones of national jurisdiction under LOSC (Source: Geoscience Australia 2005: no page)

The declaration of EEZs by coastal States in the 1970s and the introduction of extended fisheries jurisdiction signalled a shift in responsibility for fisheries management from international fisheries organisations to national authorities (Agnew & Barnes 2004; LOSC 1982 Part II; Mansfield 2004). Given that commercial fish stocks were thought to be concentrated on the continental shelves, these newly established national maritime

zones appeared to encompass most of the marine living resources that required management (Stokke 1999; Thebaud 1997). For example, Sahrhage and Lundbeck (1992: 279) state that “approximately 40 per cent of the world’s ocean and more than 90 per cent of the marine living resources were put under the jurisdiction of coastal States.” Therefore, LOSC transformed many important fish stocks from a global commons to national property resources (Apostle *et al.* 1998). Beyond national maritime waters, LOSC continued the principle of the freedom of the high seas where areas beyond national jurisdiction, including the high seas, were common property (Birnie & Boyle 1992; Butterworth & Penney 2004; Mitchell 1998).⁸ This doctrine was first formulated in 1609 by the Dutch lawyer Hugo Grotius in his work, *Mare Liberum*.⁹ LOSC defines the high seas as all parts of the sea not included in an EEZ, territorial sea, internal or archipelago sea, and confirms the principle that all States have the right for their nationals to fish on the high seas, including the Southern Ocean, subject to the respective treaty obligations and the jurisprudence of coastal States (LOSC 1982 Articles 86 and 116).¹⁰ It also creates an additional duty: “to take, or to cooperate with other states in taking, such measures ... as may be necessary for the conservation of living resources of the high seas” (LOSC 1982 Article 117). In addition, States are obliged to cooperate in the establishment of regional and sub-regional organisations (LOSC 1982 Article 118).

However, establishing national maritime zones and turning fish stocks into State property were only the first steps to manage these stocks and practical mechanisms to determine which fish *belonged* to which State needed to be determined. In particular, mechanisms to recognise territorial rights for the management of fish stocks shared by two or more States were needed (Apostle *et al.* 1998).¹¹ LOSC also brought about change in the marketplace with regard to changing patterns in fish trade. As coastal States declared their EEZs, they removed distant fishing fleets from other States from their waters. This move resulted in coastal States with abundant fish stocks (such as Canada, Iceland and Norway) becoming major fish suppliers. Other States that traditionally had fished in distant waters, (such as Japan and the Soviet Union) became fish importers, and deep-sea fishing fleets (such as Germany, Spain and the United Kingdom) lost access to traditional deep-sea fishing grounds. Consequently, the

⁸ *Mare Liberum* is defined as ‘open sea’ and it consists of common high seas spaces that are open for legitimate and reasonable use by all States and may not be appropriated to the exclusive sovereignty of one State (Birnie & Boyle 1992). No supreme authority exists for high seas spaces, and sovereign States deal with each other, with regard to their sovereignty, on a basis of equality (Litfin 1988). Common property extends to most marine living resources including fish and mammals and other species that inhabit or migrate through these areas such as seabirds. However, living resources become exclusive property once they are harvested.

⁹ According to Sahrhage and Lundbeck (1992: 277), Hugo Grotius sought to include the whole community “in propounding the free seas/common property approach to high seas resources based on occupying those areas or exhausting their fish resources.”

¹⁰ Under LOSC, all States have the right for their nationals to fish on the high seas subject to “their treaty obligations; the rights and duties as well as the interests of coastal States provided for, *inter alia*, in Article 63, Paragraph 2, and Articles 64 to 67”; and the provisions of Article 116 (see LOSC 1982).

¹¹ Shared stocks are fish stocks found in adjoining national maritime waters.

imposition of national maritime zones changed the structure of world fisheries and trade in fish products, and contributed to tensions between fishing States and to excess fishing capacity as displaced fishers sought alternative fishing grounds.

1.2.2 Excess fishing capacity

Over-fishing was recognised by the first FAO Fisheries Technical Committee in 1946 (FAO 2004c) and is widely documented as one of the most serious problems that fishery managers need to address (Hatcher 2004; Kimball 2003). Various features contribute to over-fishing, although excess fishing capacity in particular has been exacerbated with the establishment of national maritime waters (Gréboval 1999; Schorr 2004). Excess fishing capacity is calculated in terms of “the capital stock, other fixed factors, the resource stock, technically-efficient, full-utilisation of the variable factors of production (for example: energy, labour and materials) and the state of the technology” (Kirkley & Squires 1999: 79).

However, geographically proximate coastal State governments, fishing industry operators, IGOs and NGOs debate that resource geopolitics is equally important as a feature contributing to over-fishing. Hanich (1999) suggests that between 1970 and 1990 the global fishing fleet increased at a rate double that of global catch. With over-fishing in home waters the norm, and particularly with the collapse of the North Atlantic cod fisheries, competition for declining fish stocks in the northern hemisphere has been one powerful incentive for fleet owners to relocate fishing to productive grounds in the Southern Ocean, on the unregulated high seas or in the maritime zones of other coastal States in the region (Agnew 2000; Croxall & Nicol 2004). The relocation of fishing, into international waters in particular, was initially induced by the declaration of 200 nautical mile EEZs around coastal States. Coastal States reduced the global commons, removed distant fishing fleets from their waters and changed the structure of world fishing and trade (Apostle *et al.* 1998). Such reductions were aimed at high value stock such as tuna rather than Southern Ocean species *per se* (with the exception of Marbled rockcod [*Notothenia rossii*]). In addition, the EEZs targeted are often those of developing States, some of which are in the Southern Ocean. States and regional configurations of States encourage this transfer of over-capacity, providing subsidies that encourage *spillover* of capacity to shift fishing grounds elsewhere including the Southern Ocean (FAO 2001; Kirkley & Squires 1999; OECD 2004a). This over-capacity has “produced a global fishing effort that costs more than one-and-a half times the value of the catch” (Kimball 2003: 54). In 2004, the World Wildlife Fund (WWF) estimated that “worldwide, fishing subsidies total roughly 20 per cent of industry revenue” and costed at least US\$15 billion per year” (Schorr 2004: 10-11).¹²

¹² Fishing subsidies are justified by a wide variety of political imperatives and include grants, low-cost loans, loan guarantees, tax incentives, price, income support, discounted insurance, construction or maintenance of infrastructure, fuel and tax credits, and vessel buy-back programs (see Schorr 2004).

In an effort to implement LOSC, curb the impacts of excess fishing capacity, reduce over-fishing and improve the conservation status of commercially-exploited marine species, the international community has enacted various binding international laws and soft law agreements that include the following:

- **fishery management measures** by regional fishery management organisations (RFMOs) such as CCAMLR, the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) or the International Whaling Commission (IWC);
- **international cooperation** for the sustainable management and conservation of species listed in international conventions such as the CBD and Convention on Migratory Species of Wild Animals (CMS);
- **sustainable management recommendations** contained in soft law instruments such as the Code of Conduct for Responsible Fisheries (CCRF) and various international plans of action (IPOAs); and
- **trade management measures** that include those species listed in the three appendices to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) or those assessed under the Marine Stewardship Council (MSC) certification program.

Although binding laws and soft law agreements have been cooperatively developed to reduce excess fishing capacity and over-fishing, illegal fishing has occurred in a number of fisheries and illegal fishers have conducted their activities outside the constraints of management and trade measures.

1.2.3 Illegal fishing

Whaling ships and European cod fishing fleets extensively fished the world's *distant* fisheries from the sixteenth century (FAO 1995). However, illegal fishing, which dates back to 260 BC in Athenian waters by rogue fleets based in the Asia Minor Greek cities, helped trigger a series of mini-conflicts between Athens and its trading partners (OECD 2003a). Illegal fishing continues to flourish and is worth between US\$4 billion and US\$9 billion a year, with US\$1.2 billion per year coming from the high seas (see Gianni & Simpson 2005; HSTF 2006; Trent *et al.* 2005). The number of incriminated vessels illegally fishing between 1980 and 2003 is illustrated in Figure 1.4.

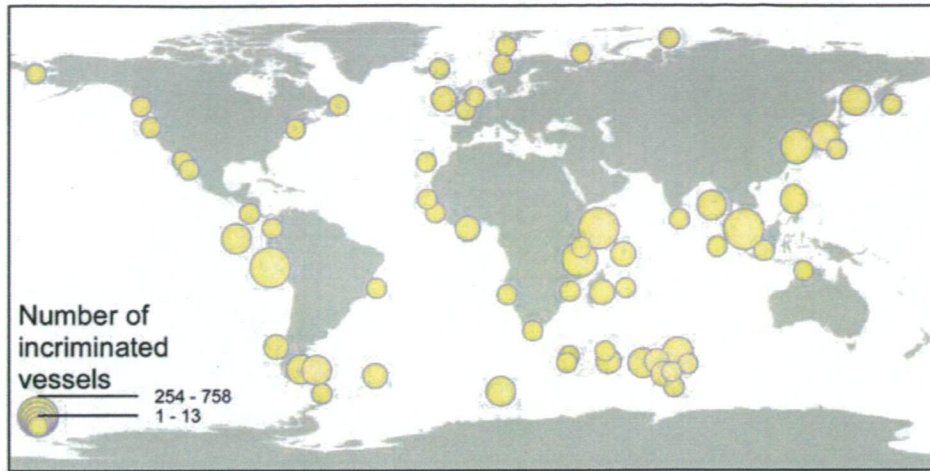


Figure 1.4: Number of vessels reportedly illegally fishing between 1980 and 2003 by zone of activity (Source: Sumaila 2004: 7)

The recent codification of international law governing sovereign maritime rights in respect to oceans and seas under LOSC has enshrined a particular meaning to IUU fishing at law. The acronym originated in the international regulation of marine capture fisheries, and the 2001 International Plan of Action on IUU Fishing (IPOA-IUU) provides guidance on the meaning of the three components in paragraphs 3.1-3.4:

3.1 Illegal fishing refers to activities:

- 3.1.1 conducted by national or foreign vessels in waters under the jurisdiction of a State, **without the permission** of that State, or in contravention of its laws and regulations;
- 3.1.2 conducted by vessels flying the flag of States that are parties to a relevant regional fisheries management organisation but **operate in contravention** of the conservation and management measures adopted by that organisation and by which the States are bound, or relevant provisions of the applicable international law; or
- 3.1.3 **in violation of national laws** or international obligations, including those undertaken by cooperating States to a relevant regional fisheries management organisation.

3.2 Unreported fishing refers to fishing activities:

- 3.2.1 which have **not been reported**, or have been **misreported**, to the relevant **national authority**, in contravention of national laws and regulations; or
- 3.2.2 undertaken in the area of competence of a relevant regional fisheries management organisation which have **not been reported** or have been **misreported**, in contravention of the reporting procedures of that organisation.

3.3 Unregulated fishing refers to fishing activities:

- 3.3.1 in the area of application of a relevant regional fisheries management organisation that are conducted by **vessels without nationality**, or by those **flying the flag** of a State not party to that organisation,¹³ or by a

¹³ A 'Party' is a State that has agreed to abide by the obligations and conditions of an international agreement and may, or may not, participate in the decision-making process of that agreement.

- fishing entity, in a manner that is not consistent with or contravenes the conservation and management measures of that organisation; or
- 3.3.2 in areas or for fish stocks in relation to which there are **no applicable conservation or management measures** and where such fishing activities are conducted in a manner inconsistent with State responsibilities for the conservation of living marine resources under international law.
- 3.4 Notwithstanding paragraph 3.3, certain unregulated fishing may take place in a manner which is not in violation of applicable international law, and may not require the application of measures envisaged under the International Plan of Action (IPOA) (FAO 2001a Paragraphs 3.1-3.4).

According to Agnew and Kirkwood (2005), Greenpeace Australia Pacific (2004) and Hutchinson (2004), in addition to excess fishing capacity and associated government subsidies, IUU fishing is a significant threat to the sustainability of the world's fisheries. It has doubled in the past 20 years (Brown 2000) and accounts for up to 30 per cent of total fish catch (FAO 2001c). However, there are currently no statistics on global IUU fishing because IUU fishers hide their activities and launder their catches. What is known is that IUU fishing includes a wide variety of undesirable fishing activities and practices ranging from legitimate operations cheating at the margins (for example: exceeding catch quotas or retaining and landing under-sized fish) to entirely illegal operations where fishers have no entitlements to take fish in a regulated fishery. It is a problem in regulated fisheries within national maritime waters and those located on the high seas.

According to the chairs of the Organisation for Economic Cooperation and Development (OECD) *Workshop on IUU Fishing Activities* held in Paris during April 2004, in many cases, the burden of IUU fishing activities "is borne by the fishing industry" and they jeopardise the economic survival of legitimate operators (OECD 2004a: 1). In this sense, IUU fishers are greedy; they rob the global commons and impoverish both nature and the global community. They are *free riders* who disregard authority and benefit unfairly from the sacrifices made by legitimate fishers who respect laws, comply with fisheries management and conservation measures, and pay the necessary regulation costs (Balton 2004; Brown 2000; Exel 2004a; Rigg 2004). For Hatcher (2004: 4) IUU fishing "mortality is increased to a level which is economically damaging ... and ... it imposes a net social cost." For example, the visible presence of IUU vessels and the financial rewards IUU fishers gain from their activities may tempt other fishers to violate regulations, fish in restricted or protected areas, or use prohibited gear or gear that negatively impacts upon the environment. In short, the success of IUU activities signals weak enforcement and a lucrative return for less fishing effort. IUU fishing may also undermine the perceived stock-related benefits from regulatory compliance and significantly reduce the quality of catch landing data on which to base stock assessments. In addition, it undermines the efforts of RFMOs, national governments and licensed fishers to manage and conserve the fisheries in a sustainable

manner and protect non-target species (that might be harvested as incidental bycatch) affected by fishing activities.

1.3 Fishers target the Patagonian toothfish

This investigation focuses on a fishery that is new by world standards and under pressure from over-fishing, excess fishing capacity and IUU fishing: the Patagonian toothfish fishery. Also known as Mero, Chilean sea bass, Black hake and *white gold*, this fish is the most valuable and lucrative fishery kilo-by-kilo in Antarctic or sub-Antarctic waters (Ashford *et al.* 2005; Fallon & Kriwoken 2004; Greenpeace 2002). Belonging to the family *Nototheniidae* it is a large (reaching over two metres and weighing in excess of 100 kilograms), brownish grey, long-lived (~ 50 years), slow growing (maturing at eight to ten years), deep-sea muscular predator that lives in deep waters from 300 to over 3,500 metres (AAD 2002c; AFMA 2001; 2005e; Agnew 2004a; Croxall & Nicol 2004; CSIRO 1998; Kock 1992) (Plate 1.1).¹⁴ Overall, this species has a low fecundity (Cascorbi 2002; Chikov & Melnikov 1990; Evseenko *et al.* 1998), its resilience is very low, and it is estimated that the minimum population doubling time is about four and a half to 14 years (Catarci 2004).¹⁵ In addition, it lacks anti-freeze glycoproteins in its tissues and bloodstream to prevent ice-crystal growth and is unable to survive in super-cooled Antarctic waters colder than 2°C (Eastman 1985; Eastman & deVries 1981; Williams & Trebilco 2002).¹⁶



Plate 1.1: The Patagonian toothfish (© Austral Fisheries Pty Ltd)

¹⁴ Patagonian toothfish is difficult to age because otoliths' growth rings are hard to age when the species are young. Some commentators argue that they live for at least 40 years (see Everson 2001) and others suggest they live up to 80 years (see ASOC 1998; Ecoceanos 2000). Age-validating techniques continue to be developed and current scientific research has generally established that this species lives for at least 35 to 50 years (see Ashford *et al.* 2005; Constable 2002; Constable *et al.* 2000; Williams 2001).

¹⁵ The reproductive strategy of Patagonian toothfish is characterised by low fecundity (ranging from 48,000 to 500,000 eggs per fish per spawning season) and large egg size that indicates a relatively large maternal investment in each egg (Cascorbi 2002; Chikov & Melnikov 1990; Evseenko *et al.* 1998).

¹⁶ This species has other unusual adaptations to achieve neutral buoyancy including highly mineralised bones and abundant lipids in their flesh.

The Patagonian toothfish is circumpolar in its distribution and occurs on the shelves and shelf-slopes off islands and banks in the South Atlantic, Indian, and Pacific Oceans within the influence of the Antarctic Circumpolar Current (the Antarctic Convergence) (AAD 2001a; Kock 1992; Kock *et al.* 1985; López Abellán 2005). It extends to the southern waters of Peru and Brazil; to the slope waters off Chile, Argentina and Uruguay; the sub-Antarctic islands including the Falkland Islands/Islas Malvinas (hereafter the Falkland Islands); Macquarie Island and the Campbell Plateau just above the Antarctic Convergence; and the Indo-Pacific boundary of the Southern Ocean (Agnew 2000; CCAMLR 2002a).¹⁷ In the Atlantic Ocean, Patagonian toothfish is found in more southerly regions including ones off South Georgia and the South Sandwich Islands (SGSSI) (Agnew 2004a). It is a trans-boundary stock that comprises resident, straddling and migratory fish stock depending upon each population's behaviour and migrates across the high seas and international borders that is now heavily fished (Sabourenkov & Miller 2004). Interestingly, the capture of an adult Patagonian toothfish off the Greenland coast that is thought to have migrated from Argentine waters supports the theory that trans-equatorial migration can occur by isothermal submergence (Møller *et al.* 2003; Reeb 2003; Sallé 2003).¹⁸

The closely related species, the Antarctic toothfish (*Dissostichus mawsoni*) has been more recently targeted by some fishers, although it currently comprises less than five per cent of the annual reported catch of toothfish species (Lack & Sant 2001; Tuck *et al.* 2003) (Plate 1.2).

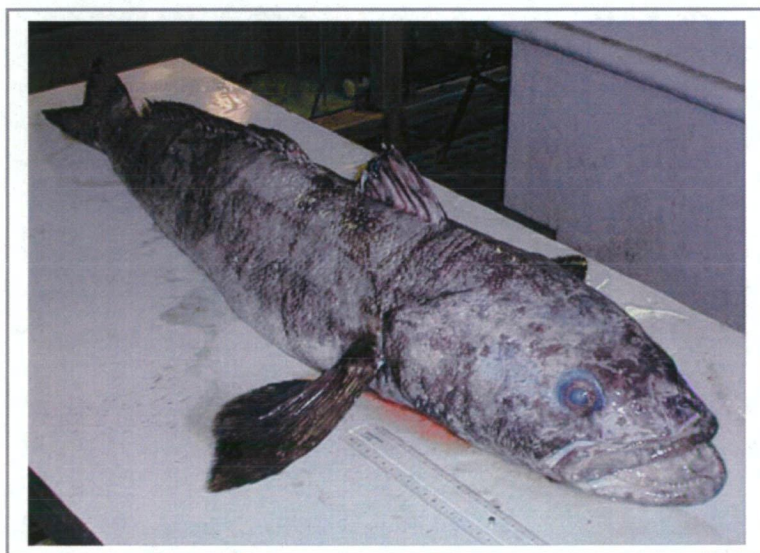


Plate 1.2: The Antarctic toothfish (© A. Sala)

¹⁷ Patagonian toothfish is found within the Convention Area around South Georgia/Shag Rocks, South Sandwich (Sandwich del Sur), Prince Edward, Marion, South Orkney, Crozet, Kerguelén, Heard and McDonald Islands. They are also found at Elan, BANZARE, Ob and Lena Banks, Williams Ridge and the northern part of the Ross Sea.

¹⁸ According to Møller *et al.* (2003: 599), a large (180 centimetre in length and weighing 70 kilograms) Patagonian toothfish was caught in the northwest Atlantic and "this extraordinary catch indicates that large, cold-temperate fishes may occasionally migrate from sub-Antarctic to sub-Arctic waters by using deep, cold water."

Much less is known about this species although it is visually similar. It is smaller (reaching up to 180 centimetres and weighing in excess of 75 kilograms), faster growing and not as long-lived (~ 30 years) (CCAMLR 1999a; Kock 1992; 2000; Lack 2001; Smith & Gaffney 2005).

Like the Patagonian toothfish, the Antarctic toothfish is pelagic and benthic, inhabiting waters from 300 to 2,500 metres. However, this species has anti-freeze glycoproteins in its tissues and bloodstream to prevent ice-crystal growth (Chen *et al.* 1997; Hansen *et al.* 1991; Johnston 1989; Williams & Trebilco 2002) and this attribute allows it to occur further south in frigid Antarctic waters south of 65°S (Agnew 2000).¹⁹ In addition, the Antarctic toothfish has a higher fecundity than the Patagonian toothfish, is faster growing and has a shorter life span. These characteristics make this species potentially less vulnerable to over-fishing. However, given that it inhabits higher latitudes, the extreme Antarctic environmental conditions may limit its abundance.

Fishers who are licensed to fish for the Patagonian toothfish (and increasingly the Antarctic toothfish) and environmental non-governmental organisations (ENGOS) estimate its commercial extinction at less than five years from 2002/03 in regions where national governments enforce little or no management controls on harvesting (Bruchmann 2004; WWF 2002). Schorr (2004: 9) suggests that this species “has been fished nearly to commercial extinction as a result of IUU fishing”, even though less than five per cent of the global IUU catch occurs in the Convention Area (AAD 2005d). In 2002, CCAMLR scientists also estimated that toothfish stocks in the Southern Indian Ocean would collapse by 2010-12 unless IUU fishing was reduced (ASOC 2002e; CCAMLR 2002c; Small 2005). Increasingly, industry members also fear unsustainable exploitation by rogue operators in national maritime zones as the high seas fisheries decrease in commercial viability (Exel 2004a). In light of the harvesting pressures that have had an impact on Patagonian toothfish stocks, industry members fear that Antarctic toothfish stocks will also be negatively impacted.

1.3.1 Managing and conserving Patagonian and Antarctic toothfish stocks

In response to fears of over-fishing (especially krill stocks), the Convention on the Conservation of Antarctic Marine Living Resources, was negotiated between 1970 and 1980 by Antarctic Treaty Consultative Parties (ATCPs), adopted in May 1980 and entered into force in April 1982 (CAMLAR Convention 1980).²⁰ It is an “open convention” (international regulatory regime) in which any national government is welcome to participate, providing it displays committed interest in the Southern Ocean

¹⁹ Some surveys have reported this species north of 60°S in the Pacific Sector of the Southern Ocean (Sabourenkov & Miller 2004).

²⁰ Negotiations commenced in 1977 following a resolution at the ninth Antarctic Treaty Consultative Meeting (ATCM), in London and a subsequent special meeting in 1978 of the ATCPs (Kaye 1995).

and engages “in research or harvesting activities in relation to the marine living resources” (CAMLR Convention 1980 Article VII(2)(b)).²¹

CCAMLR is the RFMO that manages fishing activities in the Convention on the Conservation of Antarctic Marine Living Resources Area (hereafter the Convention Area), and its 24 member governments (or State Parties) are legally bound to the regime and its principles (Figure 1.5).

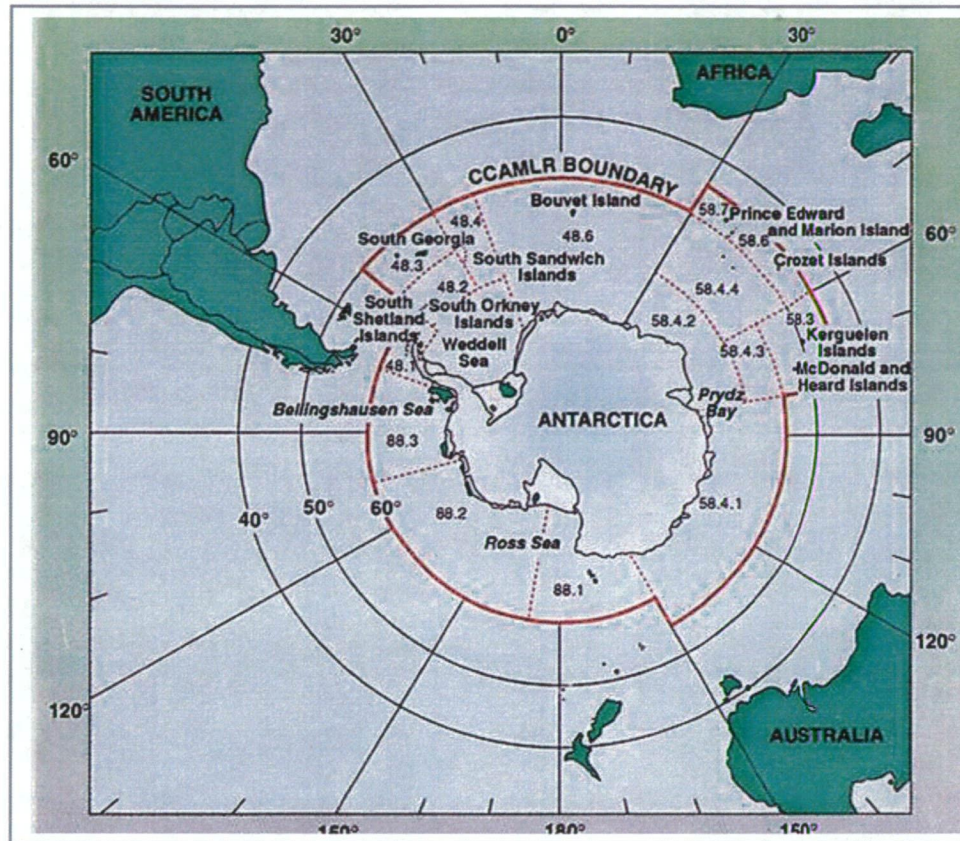


Figure 1.5: The Southern Ocean and Convention Area (© CCAMLR 2006: no page)

The Convention Area covers the marine environment between the Antarctic Convergence and the area south of 60°S, and comprises international waters (high seas), national maritime waters off Argentina, Australia, Chile, France, New Zealand, Norway,²² South Africa, the United Kingdom and Uruguay, and FAO Statistical Areas 48, 58 and 88 (CAMLR Convention 1980 Article I(1)).

²¹ An international convention or regime is an agreement dealing with a specific area or issue (see Miles 1999; Paterson 2000; Stokke 1999; Young 1989b), where a “set of implicit or explicit principles, norms, rules and decision-making procedures around which actors’ expectations converge in any given area of international relations” (Krasner 1985: 2). Regulatory regimes enhance coordinated trans-boundary or global responsibility by establishing and implementing collective legally binding rules and procedures on a specific area or issue by articulating and implementing values and goals for reducing environmental harm (Apostle *et al.* 1998). In contrast, liability regimes specify culpability in the event of trans-boundary harm where individual States are to blame for damaging another States’ ecosystems, global commons areas or global ecosystem (Wapner 1998).

²² Although Norway exercises sovereign control of the maritime waters around the remote glacial Bouvet Island, only small quantities of Patagonian toothfish have harvested here (TPCT 2005; Wikipedia 2005a).

The Convention on the Conservation of Antarctic Marine Living Resources does not extend to all activities in the Convention Area and only applies to Antarctic marine living resources that are defined as finfish, molluscs, crustaceans and all other species of living organisms including birds (CAMLR Convention 1980 Article I(2)). It was the first RFMO to take an ecosystem approach to fishery and environmental management to balance harvesting and conservation and avoid ecosystem changes that are irreversible in 20 to 30 years (see AAD 2005d; Birnie & Boyle 1992; Croxall & Nicol 2004; Molenaar 2001; Scientific Certification Systems Inc. 2005).²³ Conservation measures consider fishery impacts on entire ecosystems rather than on each harvested species in accordance with the sustainable exploitation of resources (or rational use), while considering the principles of scientific uncertainty and precautionary decision-making as listed in Article II of the Convention.

1. The objective of this Convention is the **conservation** of Antarctic marine living resources.
2. For the purpose of this Convention, the term “conservation” **includes rational use**.
3. Any harvesting and associated activities in the area to which this Convention applies shall be conducted in accordance with the provisions of this Convention and with the following principles of conservation:
 - a) prevention of decrease in the size of any harvested population to levels below those which ensure its stable recruitment. For this purpose its size should not be allowed to fall below a level close to that which ensures the greatest net annual increment;
 - b) maintenance of the ecological relationships between harvested, dependent and related populations of Antarctic living resources and the restoration of depleted populations to the levels defined in subparagraph (a) above; and
 - c) prevention of changes or minimisation of the risk of changes in the marine ecosystem which are not potentially reversible over two or three decades, taking into account the state of available knowledge of the direct and indirect impact off harvesting, the effect of the introduction of alien species, the effects of associated activities on the marine ecosystem and of the effects of environmental changes, with the aim of making possible the sustained conservation of Antarctic marine living resources (CAMLR Convention 1980 Article II).

This ecosystem approach aims to ensure that the impacts of a fishery and other dependent species are considered when fishery decisions are made, and it takes into account the needs of fishing operators and the nonhuman components of the Southern Ocean ecosystems (Butterworth 1986). It rests more on an ecological premise than upon political or economic considerations (Tucker Scully *et al.* 1986). Human harvesters are

²³ Here, ‘conservation’ is defined as the saving of natural resources for human consumption and hence includes their use. For Borrini-Feyerabend (1997), conservation embodies techniques and budgets taking precedence over peoples’ views and concerns; initiatives conceived, designed and imposed from above (the prevailing power structures decides who gains and how); and those affected being left voiceless.

treated as predators. To manage these fisheries CCAMLR members²⁴ developed a Generalised Yield Model (GYM) in the mid-1990s to set precautionary catch limits under conditions of uncertainty (see Constable & de la Mare 1996); and regulations restricting the development of new fisheries including the Patagonian and Antarctic toothfish fisheries (see Croxall & Nicol 2004).

1.3.2 Over-fishing

Exploratory trawl fishing for Patagonian toothfish started as early as 1955 off the Chilean coast (Agnew 2004a) and expanded to a commercial, small-scale artisanal fishery off central Chile during the 1970s (Lemaitre *et al.* 1991). Patagonian toothfish stocks were then discovered around the Kerguelén Islands in 1984 (Palomares 2003) followed by large-scale Soviet Union (later Ukrainian) fishing fleets discovering commercial quantities of this species in 1985 (CCAMLR 2002a; Fallon & Kriwoken 2004). With the development of longlining in 1985/86, a substantial fishery began when Spanish operators discovered commercial Patagonian toothfish stocks off southern Chile in the southeast Pacific Ocean sector in the late-1980s, which rapidly expanded in 1992 to southern fishing grounds so producing higher yields (Lemaitre *et al.* 1991; Kock *et al.* in press). Since 1994, this fishery has expanded rapidly eastwards across the Southern Ocean (AFMA 2001; Agnew 2000; CCAMLR 2002a; Sabourenkov & Miller 2004). After the Japanese developed a taste for this fish in 1996, a large-scale commercial industry commenced and the fishery changed fundamentally from bottom trawling to almost exclusive demersal longlining (Duhamel 1993 in Palomares 2003). From 1997, fishing effort has extended southward into high-Antarctic coastal waters, including the Ross Sea, where Antarctic toothfish is principally targeted (Croxall & Nicol 2004; Fleshler 2005; Lack 2001; Stone 2002b).

With over-fishing in national waters, heavy competition for declining stocks in the Northern Hemisphere was a powerful incentive in the late-1970s and early-1980s for fleet owners to relocate to more productive and less regulated krill and finfish fishing grounds in the Southern Ocean.²⁵ According to Greenpeace (1997), national governments and IGOs focused on political and economic alliances often encouraged the transfer of excess fishing capacity to the Southern Ocean by providing subsidies to fishers to move elsewhere. For example, the European Union (EU) paid subsidies called *exit grants* to vessel owners in an effort to transfer excess fishing capacity to other nations' waters. The export of fishing over-capacity to the Southern Ocean carried with

²⁴ A 'Member' is a State that is a party to an international convention or regime and is a participant of the agreement's decision-making process.

²⁵ According to Karnicki (1988), vessels from Chile, South Korea, Taiwan, Poland, Soviet Union, East Germany and West Germany explored these waters during this period. Many fishing fleets that relocated to the Southern Ocean were owned by multinational fishing companies such as the Spanish-based Pescanova Group (see Greenpeace 1997). This company targets Patagonian toothfish stocks and provides an excellent example of how a powerful and extensive worldwide fishing and seafood marketing operation is able to offset the impact of declining catches in one region by substituting supplies from another.

it the same environmentally negative practises that led to many declines or collapses of fish stocks in the fishers' national waters. In addition, by relocating fishing capacity to the Southern Ocean, national governments were less able to hold their companies accountable for the actions or ecological and social damage resulting from the activities of their fishers in these distant waters.

In response to excess global fishing capacity from the Northern Hemisphere fisheries transferring to the Southern Ocean fisheries, and fishers subsequently heavily targeting Patagonian toothfish stocks in some fishing grounds, a number of States have instituted hard laws and soft law agreements to protect the fishery. However, accelerating consumer demand over the past 15 years and high prices for such high quality fish (influenced by declining supply of other species) continue to encourage fishers to exploit Patagonian toothfish stocks and supply Patagonian toothfish products to these markets. The capacity of fishers to supply products has also been fuelled by advances in fishing technology including the development of longline fishing that is able to target specific size classes of fish and sophisticated satellite communication systems that allow fishing masters and company directors to ascertain in *real-time* the best markets on which to offload their products. In addition, the biological characteristics of the Patagonian toothfish and preference for near land habitats combine to make this species especially vulnerable to over-fishing (Agnew 2000; BOI 2004; Waterhouse 2001; Williams 2001). These factors have resulted in increasing stress on the relatively small Patagonian toothfish fishery (by world standards) and the viability of supply being questioned.

1.3.3 IUU fishing

Increasing consumer demand for toothfish products has also led to exploitation pressure that derives from IUU fishing, where IUU fishers have targeted Patagonian and increasingly Antarctic toothfish populations (see, for example: Agnew 2004a; Australia 2005c, CCAMLR 2005b; Kirkwood & Agnew 2004; Molenaar 2003; 2004; OECD 2004a, Stokke & Vidas 2004; Vidas 2004; 2000). IUU fishing also challenges accepted moral and legal norms because IUU fishers operate outside both international law and national laws by coastal States, flag States, or the State of nationality of the natural or juridical person contravening the enactment. It also challenges legitimate fisheries management activities undertaken by governments and CCAMLR members both inside and outside the Convention Area.

Paradoxically, the same technological developments that led to the more efficient capture and marketing of fish species also assists IUU fishers because they are enabled to harvest fish quickly before being detected by authorities or they can avoid apprehension by using information transmitted on satellite communications to keep track of fisheries surveillance activities. Significant technological advances occurred in the toothfish fishing industry in 2002 when IUU sophisticated fishing vessels equipped

with state of the art satellite technology were employed by IUU fishers to avoid detection and apprehension.

According to the National Environmental Trust (NET) “a good haul can bring US\$3 million” (NET 2004c: 7), and the Florida Museum of Natural History (FMNH) estimates that Patagonian toothfish is worth “about US\$7,000 per tonne” (FMNH 2004: no page). Legitimately caught Patagonian toothfish is worth approximately US\$4,000 per tonne for processed weight and US\$3,500 per tonne for illegally caught product. From 1996 to 2004, and during the time when this fish has been the most heavily targeted, legally caught fish has been worth approximately US\$515 million and illegally caught fish worth approximately US\$485 million. Therefore, the total value of the Patagonian toothfish fishery over this period is approximately US\$1 billion; being conservatively worth between US\$100 million per annum (FMNH 2004; Hutchinson 2004; Lewy 2004) and US\$150 million per annum (Miller 2002).

Many approaches have been taken to mitigate IUU toothfish fishing activities. To date, they have centred on punitive regulatory measures by national governments such as monitoring, control and surveillance (MCS) actions focusing on border surveillance and control, apprehensions of alleged IUU vessels, court actions against illegal operators, and confiscation of illegal catches. In addition, IUU fishing has been one of the “biggest issues on CCAMLR’s agenda” (Australia 2005f: 54) and CCAMLR members have introduced nearly 100 conservation measures developed by consensus to conserve the Southern Ocean marine resources. However, these efforts have failed to stop IUU fishing activities. Thus, if CCAMLR is considered exemplary by world standards, but has been unable to stop IUU fishing of Patagonian toothfish stocks, this outcome does not auger well for other global fisheries that are also being negatively affected by IUU fishing activities.

As a result, CCAMLR members are now starting to focus on the social elements that impact upon the toothfish fisheries, including the assessment of economic and social drivers that fuel the industry, trade activities and consumption, cultural norms, and the reasons for non-compliance by some fishers and operations (Agnew & Barnes 2004; Bassett 2004; Exel 2004a OECD 2003; Whitlow 2004). Perversely, as consumer demand increases, and as legal fishing is constrained by catch and effort limits and various conservation measures, the motivation for and gains from IUU fishing increase. Thus, efforts to combat IUU fishing need to recognise this fact and be integrated into wider fishery policy developments and initiatives, such as the expansion of legitimate and responsible forms of fishing (including aquaculture), the reduction in fishing vessel capacity and the increasing need to adopt an ecosystem approach to the management of fish stocks and related species (Bray 2000).

Therefore, given insatiable demand for Patagonian toothfish and its high market value, legitimate and illegal fishing of these stocks has continued to flourish. Myers and Worm

(2003) identified that fish stocks collapse by about 80 per cent within the first 10 to 15 years of commercial exploitation and then stabilise at around eight to 10 per cent of the original numbers. Given the current catch rates for Patagonian toothfish, fishery managers maybe unable to manage these stocks sustainably because they will only be *stabilised* to an already pre-existing exploited level. Ultimately, over-fishing Patagonian toothfish stocks has the potential to significantly affect the Southern Ocean ecosystem because, as a top predator (Ashford *et al.* 2005), this species may provide an important food source for seals and whales (AFMA 2005e; FMNH 2004; Kock *et al.* in press).²⁶ However, uncertainty remains about its role within the ecosystem or whether there are linkages between this species and other marine species. IUU fishing for Patagonian toothfish exacerbates these uncertainties and raises environmental concerns, particularly with regard to the environmental impact upon these stocks (particularly juvenile and mature reproductive fish). It also raises other environmental concerns including the incidental mortality of bycatch species that are indiscriminately caught on longline and trawl fishing gear, pollution (including the risk of discarded longline equipment threatening marine mammals when they become entangled in the lines), and damage to benthic (bottom dwelling) communities from fishing gear being dragged across seabeds (see, for example: Agnew 2000; Brothers 1991; CCAMLR 2005b; COLTO 2003a, b; Haward *et al.* 1998; Sabourenkov & Miller 2004; Tuck *et al.* 2003). In addition, IUU fishing seriously compromises international and national jurisdictional arrangements, CCAMLR, the economic viability of the licensed Patagonian toothfish fishing industry and potentially, the sustainability of communities and individuals who depend on fishing.

1.4 Investigating power relations

1.4.1 Increasing stakeholder attention

The *Patagonian Toothfish Network* has increasingly attracted numerous and diverse groups of human, nonhuman and inhuman actors in a web of relations. Most notably, governmental or non-governmental human actors exploit, manage, trade, eat, conserve or protect this species and they may be autonomous and possess self-contained decision-making processes that are not determined by others (see Manbach *et al.* 1976). They are stakeholders, and throughout this study I investigate these and other actor-networks influencing the Patagonian toothfish. The actor-networks may be described as follows:

²⁶ According to AFMA (2005e), studies on seals and other higher order predators suggest that the Patagonian toothfish is not important prey species for these animals.

1. **State actor-networks** comprise government officials²⁷ from more than one State who form actor-networks of IGOs, and RFMOs that range from the United Nations (UN) and the EU, to CCAMLR and the Agreement on the Conservation of Albatross and Petrels (ACAP).²⁸ Personnel from agencies (including officials, fishery managers and scientists) of a single central national government are also embedded in state actor-networks. However, although governments may be collectively regarded as unified entities, their parts may behave autonomously and competitively, regionally, or may be parochial and only peripherally concerned with international relations.
2. **Non-state actor-networks** interact in the international political system. They tend to form *sovereignty-free* actor-networks including the voluntary or *not-for-profit* NGO sector, industry operators, independent scientists, traders, consumers and the general public.²⁹ They encompass groups of individuals who are functionally diverse, are not bound by national governments and are able to act in a private capacity to advance certain causes that have translational political or public relevance (see Bromley 1997; Rosenau 1990; Wapner 2000).
3. **Non-state and nonhuman actor-networks** include the Patagonian toothfish and the other components of the Southern Ocean ecosystem.
4. **Inhuman material actor-networks** comprise technologies, communications, facilities, inscriptions, data, meetings and markets.

Given the scalar complexity of the rationale under investigation, the world politics paradigm is useful to assess the interactions of the actor-networks.³⁰ Rather than focusing on the State-centred view as the only power that can accomplish political change or effective input into managing and conserving the Patagonian toothfish, I investigate a more complex world where the alignment of actor-networks is flexible and formed using different means of pursuing complimentary objectives. These actor-networks are often ideologically diffuse and the issues they use may be multi-polar and transcend national boundaries (Mansbach *et al.* 1976). A high level of interdependence may also be fostered between the actor-networks through modern communications and the media, and transport and trading facilities. Here, material actor-networks come to

²⁷ I draw from Dean (1999: 11) who defines 'government' as "any more or less calculated and rational activity, undertaken by a municipality of authorities and agencies, employing a variety of techniques and forms of knowledge, that seeks to shape conduct by working through [our] desires, aspirations, interests and beliefs."

²⁸ IGOs provide essential fora for international cooperation in relation to environmental issues in terms of environmental policymaking and the development of international law (Birmie & Boyle 1992).

²⁹ NGOs have become increasingly prominent and influential in world politics over the past 25 years for reasons including the rise of pluralism in States, spread of information technologies and increased global, interstate and non-state contacts. For Gordenker and Weiss (1996: 7), they are the "basic form of popular participation and representation in the present-day world."

³⁰ The world politics paradigm consists of interactions between significant actor-networks whose characteristics include "autonomy, control and substantial resources and participation in political relationships across state lines" where bargaining occurs between autonomous and semi-autonomous actors and networks (Darby 1994: 20).

the fore because the influences impacting upon the Patagonian toothfish are not just physical; they are fuelled by informational phenomena which are socially constructed through multiple understandings and struggles among contested knowledge claims (see Leipold 2000). Access to and controls over information are crucial and controversial elements of environmental decision-making in this arena.

In relation to the Antarctic and Southern Ocean, Beck (1990: 110) argues that neither NGOs nor public opinion have proved a driving force in managing Antarctic marine living sources, although the course of developments from the late-1980s highlight “that for the first time a significant, even decisive, policy input was coming from below.” Other commentators argue that the involvement of NGOs in Antarctic affairs over the last 25 years marks an important change in the management of Southern Ocean fisheries. However, Darby (1994) suggests that only state actors have the power to accomplish political change, and non-state actors can do little more than encourage new directions. For Taylor (1984), the proliferation of NGOs has not altered the fundamental role of state actors in world politics because they have the *option* to join or refuse membership in government fora or to participate in, or abstain from, any decision taken in an international organisation in which they are members. Effectively, “they may veto any action they find objectionable when the unanimity voting principle is applied” (Taylor 1984: 3). Although state actor-networks may still be the primary actor-networks in this controversy, I consider the changing influence of other actor-networks and particularly the willingness of non-state actors to take significant political risks to achieve their objectives.

The harvesting, management and conservation of the Patagonian toothfish is a politically sensitive issue in terms of the contested sovereignty over Antarctic marine living resources particularly in the high seas; the relations between increasingly wealthy and technologically sophisticated trans-national toothfish fishing corporations, and their ability to operate in an emerging globalised economy;³¹ and tensions over the ecology and economy of fishery management outcomes in terms of rational use and *conservation* of marine resources. Other controversies include the increasing influence of non-state actors and their inclusion in participation models of management and decision-making; and the environmental and economic merits of various fishing techniques in terms of reducing environmental damage and bycatch and increasing economic efficiencies. Tensions among these actors and with the connections they form influence environmental outcomes for the Patagonian toothfish and social and economic outcomes for other human actors. For example, policy-makers often find themselves squeezed between domestic demands and international obligations. The tension policy-makers feel may be largely the consequence of free trade agreements and negotiated

³¹ Although a fundamental modern concept, ‘globalisation’ has multiple definitions. It can be described as a growing interconnectedness or economic accumulation and interdependence (see Brahm 2005; Paterson 2000). There is debate on whether globalisation is a positive development, or if it is anti-ecological and exacerbates conflict, self-interest, corporate power, and disregard for people and communities.

settlements on harvesting rights within the context of the global economy (Apostle *et al.* 1998). However, in many instances, lack of international cooperation undermines the efforts of national governments, industry operators and NGOs to manage and conserve this species. The undermining of cooperative efforts can occur because some actors lack the jurisdiction or political power required to manage the Patagonian toothfish in the interests of the ecosystem and communities, particularly with regard to fish stocks that straddle lines of extended jurisdiction.

Overall, these views of power dynamics affecting the Patagonian toothfish fisheries are limited and this research seeks to investigate how complex and often hidden power relations affect outcomes in unexpected ways. For example, inhuman material actors can act in powerful ways in a web of action when they convey compelling or influential information to other human actors. Therefore, I challenge traditional assumptions about power, and argue that it is necessary to understand the contribution that all actor-networks make to government fora and to local, regional and international fisheries management initiatives if long-term management and conservation outcomes are to be achieved. Here, the key actors come to the *negotiation table* with their own agendas, motivations, strategies, aspirations, political imperatives, and modes of being and doing, and I hope to establish how these traits influence the debate and might advance or hinder conservation outcomes for the Patagonian toothfish. Given that all environmental *problems* are influenced by these traits, findings from this study might be useful in helping to bring people together to promote better environmental outcomes in other fisheries or natural resource management arenas. At least by recognising how power is brought to the negotiation table, I hope to assess motivations and how the *Patagonian Toothfish Network* might work in the future. I also hope to document and evaluate the often hidden efforts that some actor-networks contribute to exploiting, managing or conserving the Patagonian toothfish. Given that the human actors in this debate often serve their own self-interests, perhaps the only actors who really care about this species might be the fish themselves.

1.4.2 Actor-network theory

Although this study rests on a foundation that is based on traditional empirical methodological approaches to investigate IUU fishing as a practical problematic in the Patagonian toothfish fishery, it also seeks to mobilise a theoretical perspective that is embodied by ANT in a new and innovative way. Based within the social sciences and indebted to qualitative research methodology (Tatnall & Gilding 1999), ANT traces actor-networks and outlines, describes, delineates, inscrolls, files, marks, records, lists, or tags trajectories that label an actor-network (Erlendsson 2001; Latour 1998c; Schultz 1998). ANT provides an analytical approach (or interpretative lens) to describe groups of human actors (such as fishers, scientists and government officials), nonhuman actors (such as the Patagonian toothfish and biological elements that make up the Southern Ocean) and inhuman actors (such as technologies, inscriptions and money) as equal and

synonymous actor-networks tied together in a web built and maintained to achieve particular goals (Basden 2002; Cordella & Shaikh 2006; Gomart & Hennion 1999; Lockie 2002; Stalder 1997a). This approach is political and emphasises actor-networks of differing size, scope and power where researchers apply principles of symmetry and accept nature and society as equal (Goodman 1999; 2001; Holm 2001; Latour 2004). It allows researchers to understand issues without giving theoretical or methodological primacy to humans, ideas, words, scientific data, technology or the other things that make up the natural or social worlds because entities are part of a continuously developing, dynamic system (Kendell & Wickham 1998). ANT also embraces scientific realism, social constructivism and discourse analysis within a central concept of hybrids that are simultaneously real, natural, social and discursive.

ANT is highly *textual* where the emphasis is on inscriptions and *immutable mobiles*³² that link actors with distant entities, events, spaces or places (over varying times) (Basden 2002; Inkinen 2001; Latour 1987; 1990; Murdoch 1997a). These intermediary, inhuman actor-networks are important because they provide the means for a few actor-networks to affect others through their ability to mobilise power. Once many intermediaries are made to act as one and their coordination and optimal circulation is strong, the actor-network becomes more stable and predictable. However, if the circulation of these intermediaries is not optimised they fail to connect with one another, translation is denied and dissidence occurs when they follow their own path. The key is to identify “chains of intermediaries” which results in an ultimate *head-actor* emerging through the progressive mobilisation of actor-networks (Callon 1986: 216). It is also about “expressing in one’s own language what others say and want, why they act the way they do and why they associate with each other”; it is to establish oneself as a head-actor (Wood 2001: 11).

In this context, I draw upon ANT in this study and refer to Latour (2005: 144) who recommends that researchers “just describe the state of affairs at hand” rather than provide examinations. However, although I adopt the basic terminology of ANT, I do not necessarily concur with all its propositions and remain ambivalent about its merit. Importantly, given that one of the purposes of doctoral research is to create knowledge and/or unsettle accepted norms, my aim is to illustrate some of the issues, advantages, challenges and uncertainties in using this approach. This study mixes natural, political, cultural, social and economic claims to construct *truth* by uncovering links and nodes in the *Patagonian Toothfish Network* and interpreting the results. I also attempt to be multi-faceted, entrepreneurial and indiscriminate, refrain from making any *a priori* declarations (such as assuming that governments hold *the answers* to managing and

³² *Immutable mobiles* are mobile, stable and combinable, and they should allow a few actor-networks in strategically placed centres to dominate many places, spaces and times (Latour 1990; Murdoch 1997a). For example, the Patagonian toothfish can be reconstituted into a scaled and modelled fishery resource that can be made calculable by catch statistics, abstract modelling data and maps and transported from its natural environment to social constructed fishery management fora.

conserving the Patagonian toothfish), and try to be reflexive and not assume that my own perspective is superior to those of the research subjects (Steins & Edwards 1999).

I consider how actors become first interested in, and enrolled into, a particular actor-network through accepting a specific problematic, and how the actor-networks change in relationship to each other to make collective progress. It is through the process of *actantality* that the actor-networks are changed and possibly transformed into a stabilised actor-network or *black box* (see Latour 1987; 1991; 1999a; Selman & Wragg 1999; Vandenberghe 2002).³³ Actors in the *Patagonian Toothfish Network*, whether they are individuals or groups, have different value systems and work (move power) along the links in the actor-network to maintain its integrity. They need to enrol, mobilise and translate the interests of others if the actor-network is to succeed, and explanations can only emerge once translations (the process by which an actor-network enrolls other entities) have been successful and the actor-network description is well defined and saturated (Callon 1986; Holm 2001; Law 2000a; Murdoch 1997a, b). I have also needed to enrol other actor-networks in my point of view through the text to ensure the study is constructed by translating interests.

Nonetheless, the mobilisation of ANT in this study results in an unresolved tension between the practical and core problematic that is IUU fishing, which is founded in pre-theoretical empirical case study, and the theoretical understanding of such a phenomena from an actor-network perspective. As such, the mobilisation of IUU fishing as the entry point into this study pre-defines the type of activity that IUU fishing embodies. In this context it is considered as a moral failing and a crime. Whilst IUU fishing is arguably a socially unacceptable criminal activity, the interesting focus from an ANT perspective is to examine how certain activities get to be identified as IUU fishing in the first instance. ANT also seeks to uncover how and why specific ecological, moral and legal labels become attached not only to the actor-network that makes visible IUU fishing, but also other actor-networks. From an ANT perspective, IUU fishing is not an uncontested given of negative possibilities.

From this perspective, I consider the problematic of IUU fishing as a question about how the category and reality of this activity emerges as an actor-network effect within the resource management actor-network of the Patagonian toothfish. Perhaps, as Examiner 2 suggests, IUU fishing is not only a *problem to be fixed* because the mobilisation of ecological, moral and legal labels that become associated to it may also make visible other actor-networks that can also be mobilised to curtail socially contested fishing practices. For example, the manifestation of IUU fishing may give ecological, moral and legal substance to other concepts such as sustainable fisheries

³³ The black box was traditionally used in cybernetics where arrows indicate what goes into the black box and what goes out; the actual contents and workings of the box are not examined (Vandenberghe 2002).

management, rational use, the use of precaution as a management approach, legitimately licensed fishers, sustainable fishing practices and so forth.

With these issues in mind, I acknowledge the unresolved tensions that remain in the study between the practical research focus and the theoretical approach. Nonetheless, I attempt to settle the unresolved tensions by condensing the practices covered by the ecological, moral and legal labels that have become associated with IUU fishing within a single actor-network. I focus on the social manifestation of IUU fishing as a dissident actor-network and describe how it becomes available as a powerful, but contested, activity. In addition, I describe how this instrument has been mobilised by other actor-networks to influence the practices of fishing, fisheries management and fish consumption more broadly. Rather than seeing IUU fishing only as a bounded criminal activity, I describe how the activity has become an emerging technology that has made visible other actor-networks and activities that have been progressively enrolled into the *Patagonian Toothfish Network* to negatively, and positively, impact upon the fishery.

Significantly, although there are many philosophical examples of ANT in the literature, practical guidance on how to apply this approach to real world problems is rare. Consequently, this investigation draws on ANT constructions to illustrate descriptively how various actor-networks in a *Patagonian Toothfish Network*, such as IUU fishing, are able to mobilise complex socio-natural-material actor-networks of heterogeneous actors as illustrated in Figure 1.6. It shows how the linkages proposed by certain head-actors, including myself, and supported by actor-networks, achieve mobilisation of locally situated power relations to act at a distance. The linkages proposed by certain head-actors also illustrate the success or failure of the actor-network. The main ideas of ANT and this actor-network are explored in Sections 2.2 to 2.4.

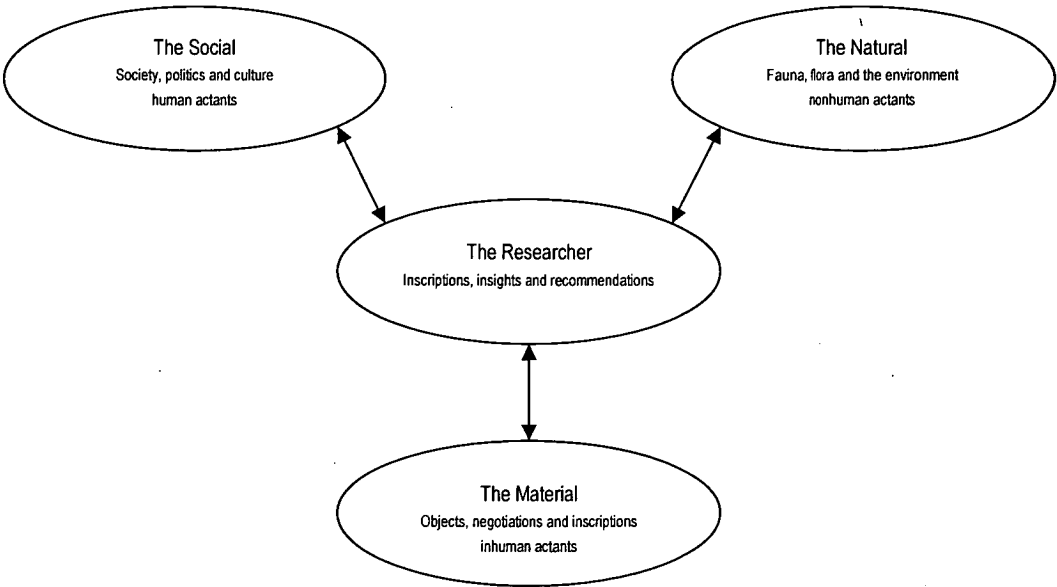


Figure 1.6: The socio-natural-material actor-network where I, as the researcher, re-image the society-nature-material nexus in a tripartite and ontologically equivalent way

I also consider traditional organisational models of bureaucracy, market and community (that describe the various actors and networks they form) because they provide a starting point to understand the pressures impacting upon the Patagonian toothfish and explain the complexities of managing and conserving this species. The organisational structure for the Patagonian toothfish is detailed in Table 1.1. In this organisational model, transactions governed by the hierarchical application of rules are bound by the bureaucracy model whereas transactions governed entirely by self-interest are the *market*. Here, the *market* holds that individuals in the Patagonian toothfish fishing industry are the best judges of their own best interests, but also that the best result for society as a whole comes from individuals pursuing their own interests (Colebatch & Larmour 1993). The third possibility is for individuals to act together as a *community* or affiliation to elucidate what constitutes appropriate behaviour.

Table 1.1: Patagonian toothfish organisational model comprising state, market and community actor-networks

Model of organisation	Reason for action on society	Response to exert power	Organising principles to enrol actor-networks into the model of organisation
State Bureaucracy	Following rules	External authority, managing and conserving	Control, rules, authority, hierarchy Power, security, policy, law, governance CCAMLR, international laws and measures, national laws and measures
Market Commercialisation	Self-interest	Private ownership, harvesting, trading and consuming	Incentives, prices, profit Competition, economic efficiency, rationality, market share/expansion, risk minimisation Fishers, traders and consumers
Community Social critique	Defend interests	Self resistant, pressuring, informing and protecting	Norms, values, affiliations, actor-networks, NGOs Interpersonal ties, multiplex social actor-networks, politics, shared identities/ideologies Environmentalists and general public

Although models are abstract constructs that provide simplified representations of reality (Streeck & Schmitter 1998), they can provide understanding of an issue or organisational failure. For example, the bureaucratic model is built around the assumption that decisions will be made at the top and that orders will move smoothly down the line (Colebatch & Larmour 1993). For example, CCAMLR can develop measures that it assumes national governments will implement into national laws and which fishers will abide. However, such may not be the case. Subordinates may not follow directions or decisions from above and may engage in passive or active resistance. Alternatively, decisions may be made in a climate of uncertainty, particularly when organisations are divided into specialised segments, each with its own distinctive perspective. Finally, securing collective action by applying rules requires time and

information and officials may need to act quickly. In these circumstances bureaucracies may aim for a satisfactory outcome rather than the best one.

The market model assumes the coordination of social activity being accomplished by private dealing among individuals. This model assumes that people know what they want and can make their own decisions, and those who want products can get together easily with those with something to offer: there are no barriers to enter the marketplace. In this case it could be assumed that fishers will harvest Patagonian toothfish in a sustainable manner and traders and consumers will choose to purchase legitimately caught fish; thereby regulating a sustainable Patagonian toothfish fishery through market forces. However, difficulties occur when the entry for new or licensed fishers or traders becomes difficult and rogue monopolies emerge, and a problem of externalities can result in others being affected and individuals not having the knowledge to make judgements about the fish they purchase or to complete a legitimately sanctioned transaction. In addition, when parties agree to social activity not all those affected are necessarily present. Coase (1960) argues that a problem of externalities such as this can be dealt with by mobilising property rights (such as property rights for high sea fish resources), or if the State intervenes and enforces control through laws and regulation.

Finally, the community model relies on community solidarity and shared norms and values as a basis for organisation (such as the Antarctic and Southern Ocean Coalition (ASOC) speaking on behalf of various ENGOs and the general public with regard to conserving and protecting the Patagonian toothfish). However, there maybe uncertainty about what *the community* is or who speaks for it, and about who may commit the other members of the community to particular courses of action. In addition, ENGOs have different aims and strategies and are often in conflict with one another. Disorganisation may occur when individuals feel themselves to be members of overlapping communities of place and/or interest or they may resent following the wishes of the group. Therefore, the wishes of the community may need to be backed up by legal sanctions to prevent individuals from flouting shared values.

Organisational structures are complex, and amalgams of all three models depend upon the place, time, circumstance, stakeholders or prevailing conditions. Over the past century, notions of *the community* have shifted towards the state and market institutional orders in an effort to exercise more power in these spheres. More recently, the state and market institutional orders have vied for dominance, marginalising the community perspective. These structures and propositions are relevant in this research and I do reflect upon them. However, given their complexity and simultaneous existence, drawing boundaries between them is likely to be artificial. They also provide little capacity to consider the intrinsic values of the Southern Ocean ecosystem or the Patagonian toothfish, and that the fish are mobile and difficult to bound within a single classification or that they also form part of socio-political and cultural orderings. Other nonhuman or inhuman actor-networks may also remain hidden in these structures

although they, too, are influential actor-networks in this controversy. Given that organisational models inadequately describe the success or failure of managing and conserving the Patagonian toothfish and comprise modes in a wider *Patagonian Toothfish Network*, I draw upon ANT to investigate complex and heterogenous webs of human, nonhuman and inhuman actor-networks.

Lastly, specific case study methodology has not been used because in this ANT investigative approach, human actors form part of a heterogeneous actor-network of human, nonhuman and inhuman actors. Research boundaries are only established as the investigation of the negotiations involved unfolds and the association of actors and networks are positioned in the research inscription (see Holm 2001; Tatnall & Gilding 1999). Given that the *Patagonian Toothfish Network* is unbounded, I recognise that it is not possible to map all the actor-networks, and my approach can only hope to network those actors made evident in the investigation process. However, by focusing on one highly visible actor-network and a range of associated sub-networks from this point forward, I ask readers to consider the many different actor-networks that potentially influence this fishery and to acknowledge that the power they exert is important in reaching outcomes.

1.5 Chapter Outline

This dissertation contains 10 chapters. Chapter 2 explores the language of ANT and traces a *Patagonian Toothfish Network* that comprises three state actor-networks (CCAMLR members, national governments [and their officials and scientists] and IGOs); five non-state actor-networks (licensed fishers, illegal fishers, NGOs, communities and myself as the researcher); and two other non-state actor-networks (the Patagonian toothfish and Southern Ocean ecosystem). This description is used to unpack associated sub-networks and investigate the actors' salient characteristics and their influence in the actor-network. Chapter 3 explores how the Southern Ocean and its physical and biological characteristics form a natural actor-network and influence the marine living resources it holds. This discussion sets the scene for outlining the expansion of fishing in the Southern Ocean, and the international institutional actor-networks for managing these resources, and, specifically, the Patagonian toothfish, from an ecosystem perspective. CCAMLR and State-managed Patagonian toothfish fisheries are then described in Chapter 4 from a regional and single stock perspective. Chapter 5 examines a *Social Research Sub-network* to uncover a key pressures impacting upon the Patagonian toothfish and how dissident actor-networks form their own webs to harvest and trade IUU fish products. The increasing influence of NGOs in Antarctic affairs and the *Patagonian Toothfish Network* is examined in Chapter 6. A discussion on the contested performances between various actor-networks follows in Chapter 7. Chapter 8 draws on this discussion to introduce five principal strategies and a range of management-based actions that emerge in a *Social Research Sub-network* to manage and conserve Patagonian toothfish stocks, and possible solutions to stopping IUU

fishing. Chapter 9 unpacks these strategies and actions to focus on trade controls and explain why some NGOs are becoming more influential than others. Chapter 10 synthesises the investigation and highlights how complex and expansive the *Patagonian Toothfish Network* has become and that each actor-network's position aligns with the associations and connections it makes with other actor-networks. Finally, I make some observations with respect to lessons that could be extended to other global fisheries, and what can be gained by using ANT to investigate the influence of state and non-state actors in the management of this species.

Chapter 2

The Patagonian Toothfish Network

2.1 Introduction

This chapter unpacks the main approaches used in this investigation. It details the fundamental principles of ANT and draws upon this discussion to illustrate that it is possible to apply this approach to map the extensive *Patagonian Toothfish Network* that comprises many sub-networks. Firstly, ANT is described as a complex *actor-rhizome* ontology where human, nonhuman and inhuman actor-networks are part of natural, social and material orderings. The approach undertaken that includes ANT is then detailed, followed by a description of the *Patagonian Toothfish Network* and its various constructions, which identifies a heterogeneous range of actor-networks connected with the Patagonian toothfish. The analysis explores the ways in which the State, science, industry, NGOs and civil society are evolving and enrolling actor-networks in ways that influence the Patagonian toothfish and other actors and networks.

2.2 The descriptive language of actor-network theory

2.2.1 The origins of actor-network theory

ANT has diverse origins. Indirectly, it originated from the work of the French Philosopher, Michel Serres who in 1974 introduced the concept of translation between multiple accounts to describe movements between different knowledge and cultural forms (Brown 2002; Serres 1974; Wood 2001). It then was developed in the mid-1980s in the sociological studies of action science and technology studies among sociologists involved in the French Social *Construction of Technology* movement associated with the Centre de Sociologie de l'Innovation of the École Nationale Supérieure des Mines de Paris, and has since been embraced by a range of researchers (see Bijker *et al.* 1987).

Traditionally, researchers exempted science and text from any connections to, and/or influence by, social and cultural factors because it was regarded as a special case (Brown 2002; Kendell & Wickham 1998).³⁴ They drew from the French philosopher Michel Foucault and his ideas on the everyday exercise and transfer of power and the ways that discipline is not only to do with prohibition, regulation and reduction (see

³⁴ These analysts considered that the natural world: was real and objective; governed by underlying universal and permanent aspects; could be understood empirically through scientific laws; and solely determined the content of scientific knowledge because cultural and social factors were not relevant (Kendell & Wickham 1998). Merton (1973) then described the *ethos of science* where science possessed a rationale that was binding, not only because it was procedurally efficient, but because researchers believed it to be right and good.

Foucault 1979; 1986);³⁵ but is also about being productive and revealing when power “rests on the proliferation of new competencies that it lets emerge” (Gomart & Hennion 1999: 221). These ideas were extended to argue that science produces *truth* rather than exempting it from scrutiny by focusing on the *constructiveness* of science (Kendell & Wickham 1998). From the 1980s, Foucauldians proposed that scientific study could be subjected to scrutiny, questioned the notion that scientific knowledge was the pinnacle of all human reason, and argued that good experiments are never purely neutral because they are socially negotiated given that observation and experimentation relies on tacit knowledge (Latour 1989).

Subsequently, pre-eminent French and British researchers such as Michel Callon, Bruno Latour and John Law referred to Foucault and utilised a problem-based approach when considering scientific questions (see Callon 1986; Latour 1998b; Law 2002). They extended sociology beyond natural realism where objects were seen as *out there* (Murdoch 1997a), and beyond social realism (or constructivism)³⁶ where society was perceived as part of the human world “made by men, inhabited by men, and, in turn, making men” (Berger & Luckman 1967: 189).³⁷ They allowed “certain sets of scientific knowledge to emerge” (Kendell & Wickham 1998: 61), and proposed that other living elements such as nonhumans (i.e. animals, plants and the environment) and materials or inhumans (i.e. objects, inscriptions and technologies) were crucial parts of any social ordering (Cordella & Shaikh 2006; Orlikowski 2005; Rose & Jones 2004; Wood 2001). ANT emerged as the answer to this different thinking.³⁸

³⁵ For Foucault (1984), power is not the possession of some people who wield it over others to dominate and constrain them, but it is relational and productive. Power traverses the social realm, portioning, grouping, enclosing, separating and categorising individuals and groups. According to Fox (1999: 8), nothing is achieved without power and “knowledge and the means for operationalising it come together in one complex: power/knowledge ... in a regime of power/knowledge the techniques of power and discourse of knowledge function together.” Therefore, power is produced one moment to the next, it can break down at any moment, and once joint action stops, it is dispersed because it is not a possession (see also Foucault 1979; 1984). Therefore, power is emergent. These ideas of power are consistent with ANT where power is emergent and transferred between actors and networks, and where actor-networks can be contested at any time (Murdoch 1997a).

³⁶ Constructivists (interpretivists) are not interested in abstraction (reduction) or approximation (modelling) of a single observable reality, “but in the presentation of value-based, multiple, holistic, competing, often conflicting realities of multiple stakeholders” (Robottom & Hart 1993: 10).

³⁷ Berger and Luckman (1967) introduced *The Social Construction of Reality* where human reality was conceived as a socially constructed reality rather than naturally given. Steins and Edwards (1999) state that ANT is social constructivism, although Murdoch (1997a) and Wood (2001) dispute this claim.

³⁸ Actor-network researchers have used this approach to increase their understandings about **geography and the environment** (Callon 1986; Callon & Latour 1986; Castree 2003; Castree & MacMillan 2001; Holm 1999; 2001; 2002; Latour 1986; 1992; 1998b, c; 1999a, b; Murdoch 1997a, b; 1998; 2001; Steins 1999; Steins & Edwards 1999), **governance, planning and communities** (Cole 2003; Deleuze & Guattari 1988; Kendell & Wickham 1998; Lloyd 2000; Murdoch 1995; 2000; Selman & Wragg 1999; Wood 2001), **political economy and ecology, particularly agro-food studies** (Callon 1997; Fine 2004; 2005; Goodman 1999; 2001; Lockie 2002; Rudy & Gareau 2005), **science and information technology** (Callon & Law 1995; 1997; Cordella & Shaikh 2006; Brown 2002; Latour 1987; 1989; 1991; 2002; Law 1986; 1999a; 2000a, b; 2002; Law & Callon 1988; Orlikowski 2005; Rose & Jones 2004; Stadler 1997a, b; Star 1991; Tatnall & Gilding 1999; Underwood 1998; Van House 2001), **social psychology** (Michael 1996; Gomart & Hennion 1999), **organisational structures** (Fox 1999; McLean & Hassard 2004; Vandenberghe 2002), and **accountancy** (Robson 1992).

Actor-network researchers investigate how entities and other categories emerge from the process of actor-network building and are maintained as a result of actor-network building activities (Castree & MacMillan 2001; Erlendsson 2001). They examine how associations come into existence and how the roles and tasks of human, nonhuman and inhuman actors (those that organise) and their intermediaries (those that are organised within a set of relations) are attributed and stabilised by applying the principles of:

- **agnosticism** where they remain flexible and exercise impartiality when studying actors engaged in controversy so that no interpretation is censored (such as considering the views of government officials, scientists, fishers and NGO representatives as being *equally important*);
- **generalised symmetry** where they make a commitment to explaining conflicting standpoints in the same terms by taking a *non-modernist approach* (such as including human actors, nonhuman actors and other inhuman actors in the *Patagonian Toothfish Network*);
- **free association** where they abandon all *a priori distinctions* between the natural and the social (such as including the fish as well as the human actors as important actors in the controversy); and
- **power and politics** that they attune to all actors and networks in a *co-produced* and socio-natural web (such as the fish also exercising power on other actors in the actor-network).

ANT draws upon the concept of rhizomes having no beginning or end and connecting unlikely places (Deleuze & Guattari 1988). In this sense, the *Patagonian Toothfish Network* is like an unbounded rhizome; it is always between things and establishes connections between actors and networks, organisations of power, circumstances relative to the Southern Ocean, and the social struggles that impact upon the Patagonian toothfish.

ANT is also a poststructural,³⁹ anti-foundational semiotic research approach that explores power relations as an outcome through the continuous construction and destruction of nature and society and the analysis of heterogeneous associations where actor-networks are viewed as sets of transformations (Callon 1986; Holm 2001; 2002; Latour 1986; Lloyd 2000; Murdoch 1995; 1997b; 1998; Tatnall & Gilding 1999). In ANT, there can be no true and *valid* account of any aspect of social reality; all it can do is propose a plausible account (Basden 2002; Callon 1997). It is a repertoire or

³⁹ Poststructuralists argue that there are different and incomplete structures underpinning and being enacted in different locations (Law 2002). They “celebrate uncertainty and attempt to construct texts that do not impose theoretical frameworks on the world”, and let the prose of the world *speak for itself*, whilst remaining mindful of the difficulties involved in such a commitment (Denzin 1998: 336).

descriptive language that studies power at a distance (Latour 1987; 1997; 1998a, c).⁴⁰ In this light, ANT is an *empty frame* for describing how actors and networks behave and influence one another. It applies semiotics to all things and searches for explanations by ensuring that as many actor-networks as possible are accounted for through as many metalanguages as possible (see Law 1999a, b; 2000a, b; 2002). Actor-networks are not fixed and, like a rhizome, they are defined in relation to the actors and nodes that are connected in a web of relations.

ANT offers an approach to counter some aspects of the “double crisis of representation and legitimisation” embedded in poststructural discourses as described by Denzin (1994: 311), where qualitative researchers can no longer capture lived experience in a representative way. The crisis includes traditional criteria for evaluating and interpreting qualitative research that are problematic in terms of establishing validity, generalisability and reliability; terms that have already been theorised in other discourses such as positivism,⁴¹ post-positivism,⁴² critical theory,⁴³ and constructivism-naturalism.⁴⁴ The crisis arises because most qualitative research separates the investigator, text and subject matter because data can be analysed in terms of: the *real* and its representation in the text; the *text* and the researcher; *lived experience* and its *textual* representation; and the *subject* and his or her intentional meaning. To counter the crisis, actor-network researchers focus on the *actions* of the actors, rather than the beliefs, values or customs of those involved (see Basden 2002; Goodman 1999; Kendell & Wickham 1998; Murdoch 1997b; Stadler 1997a). They are committed to stripping research of its external claims to *validity-as-authority* to suggest that it is values and politics that govern science rather than objective epistemology. This politically

⁴⁰ For Murdoch (1997a: 740) ANT is a “relationalist theory” because social agency in the actor-network will simultaneously change another and the process of translation involves a complex series of negotiations where identities are “fought over, roles are ascribed, and power relations fixed.”

⁴¹ Positivism, post-positivism, critical theory and constructivism “can be looked at as a continuum, with rigorous design principles at one end and emergent, less well structured directives at the other” (Denzin & Lincoln 1994: 200). Positivists aim for prediction, control and objectivity (Guba 1990; Robottom & Hart 1993). They generally take an objective technical approach; post-positivists a dualistic approach and acknowledge qualitative inquiry; critical theorists a subjective emancipatory, action-constitutive approach aimed at improving the quality of human existence; and constructivists an iterative approach where they have a practical-communicative interest with the research (see also Babbie 2002; Decrop 1999; Hall & Hall 1996).

⁴² Although post-positivists aim for prediction, control and objectivity, they also seek to redress methodological imbalances by acknowledging qualitative approaches in more natural settings. Post-positivism maintains a realist perspective and faith where a set of universal truths can be measured (Firestone 1990; Guba 1990; Guba & Lincoln 1994; Neuman 2000; Robottom & Hart 1993). In this sense, post-positivists accept the notion of “the social construction of reality” (Phillips 1990: 43).

⁴³ Critical theory can be divided into post-modernism, poststructuralism and a blending of the two (Denzin & Lincoln 1994). Critical theorists are committed to social justice and view reality as a function of the social and political arrangements that dominate and control human relationships (Popkewitz 1986; 1990; Robertson 1994). For them, political neutrality is impossible because social research responds to political issues. This paradigm also embodies Marxism, materialism, ethnicism, feminism, Freireism, participatory enquiry and cultural studies (see, for example: Denzin & Lincoln 1998; Gill 1996; Guba 1990; Hall & Hall 1996; Neuman 2000).

⁴⁴ Constructivist methods are also typically qualitative because the designs for such inquiries can never be fully articulated until after the inquiry is complete since there are multiple realities and research design must develop as salient issues emerge (Denzin & Lincoln 1998; Lincoln 1990; Robertson 1994).

informed and anti-foundational position draws upon Foucault's concept of a subversive genealogy that refuses to accept discourses that "ignore who we are collectively and individually" (Racvskis 1983: 20). It seeks to understand how power and ideology operate through systems of discourse that ask how inscriptions shape the emergent political conditions; and ultimately research (in the postmodern world) because they are mobile and able to transfer power across space and time. Therefore, in the actor-network, all actors have power, but they remain powerless unless the power is exerted through the actions of other actors. In this sense, power is relational, exercised not possessed, and powerful actors are not those who *hold* the power but those able to enrol, convince, enlist and represent others by mobilising power (Latour 1986). For example, although the Patagonian toothfish holds power in the actor-network because the actor-network would not exist without it, this fish needs to enrol, convince and enlist other actors in the network to stop harvesters, traders and consumers from predating members of its community.

2.2.2 Non-modernist and symmetrical approach

Latour (1986; 1992; 1993; 1998c; 2004) proposes that researchers take an approach that involves the development of non-critical explanations that do not polarise nature or society.⁴⁵ For him, rather than explaining nature in terms of society, both are equally held together by active sets of relations that are harmoniously woven together and continuously exchange properties. Therefore, nature is not an objective entity that obeys its own laws nor can scientists claim privileged authority. This non-modernist and symmetrical approach allows researchers to dissolve dualisms, restore agency in all things, and explain both nature and society concurrently because they are co-constructed. In this light, I study humans, nonhumans and inhumans simultaneously (such as government officials, scientists, fishers, NGO representatives, fish, and other material technological, *textual*, cooperative and market actor-networks), explain truths and errors, refrain from taking any *a priori* declarations as to what may distinguish one actor-network from another and consider *meaning* by identifying points where actor-network stability can be contested (see Callon 1986; Cordella & Shaikh 2006; Castree & MacMillan 2001; Holm 2001; Rose & Jones 2004; Schultz 1998).⁴⁶ Confusions about space and time are avoided because they are not general frameworks but provisional

⁴⁵ Environmental realists consider *nature in itself*, and constructivists image *nature* as an essentially non-social and a separate domain (Castree & MacMillan 2001). Constructivists' power is anthropomorphic, held by particular social actor-networks or residing within distinct social systems such as culture or capitalism. Nature is discounted and reduced to an effect of power. However, actor-network researchers do not explain nature but explain the shared beliefs about nature because it is a facet in human construction.

⁴⁶ Assumptions presuming that significant actors are humans and that an actor's capacity to act is defined by his or her intrinsic powers, liabilities, intentionality and linguistic competence are questioned. Nature, society, technology, science, ethical, political, aesthetic, economic and textual aspects and all relations or actions are equal actor-networks in the research controversy and are considered simultaneously and continuously (Ezrahi 2005).

results of the *connections* between actors and networks (see also Basden 2002; Goodman 1999; Law 1986; Murdoch 1997a, b; 1998; 2000).

Co-constructed actor-networks are explored to explain the external reality of nature for which we are not masters, where instruments and chains in the actor-network create generalised symmetry, inequalities, hierarchies and differences (Kendell & Wickham 1998). Dualisms of past/present, micro/macro-scale, local/global, inside/outside, distant/near, up/down and subject/object are unsettled by replacing them with associations and connections that are constructed through a series of transformations and by focusing on the *blind spots* or the in-betweens of actor-networks and research questions; such as describing the role of IUU fishers, the associations they form and the power they exercise in the *Patagonian Toothfish Network*. Researchers are able to insert themselves in a “self-same time” where the outcomes of ANT investigations depend on the way the passage of time is understood given that time is paradoxical and not an irreversible line that is bounded (Serres 1995: 46). Time does not flow; it percolates in a turbulent, interrupted, mobile and unexpected way with varying degrees of stability and reversibility. These issues are relevant to this investigation because actors and networks may be close in space or time, but may be disconnected and remote when their connections are analysed (such as the differing motivations and actions of licensed and illegal fishers, or the contested alliances between various NGO coalitions). Other distant actors and networks may be close when their connections are established (such as the Patagonian toothfish and the political agency it gives to CCAMLR members acting collectively and powerfully at a distance to manage this species, or this fish and the traders and consumers who market and eat fish products). Latour (1997: 3) explains these paradoxes as follows:

I can be one metre away from someone in the next telephone booth, and be ... more closely connected to my mother 6,000 miles away; an Alaskan reindeer might be 10 metres away from another one and ... cut off by a pipeline of 800 miles that make their mating for ever impossible; my son may sit at a school with a young Arab of his age but ... they might drift apart in worlds that become at later grades incommensurable; a gas pipe may lie in the ground close to a cable television glass fibre and nearby a sewage pipe, and each of them will ... continuously ignore the parallel worlds lying around them.

Callon (1986) extends the debate to scientific and technological study. He describes the ability of researchers studying the decline of scallops and the role of fishers in a small French fishing area, St Brieuc Bay, to act impartially and acknowledge the plurality of nature. Paradoxically, he was unable to discuss society openly because nature was uncertain but society was not. For Callon (1986), the inability to openly discuss society is problematic because the researchers were able to apply social censorship to their work and only allowed their subjects to express themselves freely when speaking about nature. If the researchers of St Brieuc Bay accepted that both nature and society were equal, sociological explanations were not necessarily formed on solid foundations

because the social is “no more obvious or less controversial” than nature; and if the identity and respective importance of actor-networks is disregarded, they risk “writing a slanted story which ignores the fact that the identities of actors are problematic” (Callon 1986: 199). This argument can be extended to an increasingly complex socio-natural-material divide because, in ANT, they are created in a single process (see also Law & Callon 1988; Tatnall & Gilding 1999). These issues are important to the Patagonian toothfish because the fate of this species and other actors in the network depends on the uncertainty of nature and also on power relations exerted in an uncertain world and power exerted through technological and other material intermediaries. They are dependent on the connections they make in a dynamic actor-network that is not bounded by space or time.

In the *Patagonian Toothfish Network*, power and politics are attuned to all the actors in a socio-natural-material actor-network and their fate is considered ontologically equivalent and simultaneous. Individual subjectivity is rejected in favour of relational ethics and politics that do not discriminate on arbitrary grounds. For example, in the Southern Ocean the protection of the Patagonian toothfish, and the designation of marine protected areas (MPAs) where some Patagonian toothfish stocks might be found (such as the Australian Macquarie Island Marine Park⁴⁷ or Heard Island and McDonald Islands (HIMI) Marine Reserve⁴⁸) are subject to individual human prejudice. This subjectivity can be problematic because it offers an anthropocentric view that might fail to account for other outcomes. Although the scenario presented here defines nature by a certain delimited geographical territory where anthropocentric environmental politics can influence outcomes, it is also a contested position because it can be destabilised by other actor-networks.

Therefore, spaces in the actor-network are not considered as wholly natural, nor are they spaces where some social actors can force their own cultural ideas of what nature is supposed to embody. These spaces are *natural*, *hybrid* and *real*, and all forms of political thinking and action have an environmental dimension because natural marine spaces cannot be restricted if the Patagonian toothfish, its habitats and associated and dependant species are naturally and socially to flourish. Murdoch (1997a: 732) sums up by referring to the current environmental crisis and our recognition that humans live within webs of actor-networks, that our existence depends upon “a particular state of the biosphere” and that the quality of the biosphere can be “largely attributed to human activities.” ANT provides a way to link the divisions between nature (the Patagonian toothfish and the Southern Ocean ecosystem) and society (the fishers, fishery managers,

⁴⁷ The Macquarie Island Marine Park was proclaimed by the Australian Government in 1999, covers approximately 16.2 million hectares, and is listed under the International Union for the Conservation of Nature (IUCN) category 1a (strict nature reserve) and IV (habitat/species management area) to ensure the maintenance of habitats and specific species such as the Patagonian toothfish (Australia 2004d).

⁴⁸ The HIMI Marine Reserve was proclaimed by the Australian Government in 2002, covers 65,000 square kilometres, and is listed under the IUCN category 1a (strict nature reserve) to protect the conservation values (including the Patagonian toothfish) and territorial sea (Australia 2004e).

government officials, scientists, conservationists, traders, consumers and the community at large). These spaces are either “spaces of prescription” where relatively fixed coordinates mark out formal and standardised sets of heterogeneous relations⁴⁹ or “spaces of negotiation” where fluidity, flux and variation occur when unstable actors or coalitions of actors come together in a complex and rhizomatic way to negotiate their memberships and affiliations (Murdoch 1998: 370). In this investigation, nature and society are always in flux and the actor-networks continue to reshape themselves and add new layers of behaviour, politics and/or regulations to their actions. For example, with the decline of Patagonian toothfish stocks in many fishing grounds, new state and non-state actors have entered the management and conservation debate over the past 25 years and technological developments continue to empower the actor-networks in this controversy. This changing dynamic is described in this research.

In this regard, I contend that nature is as equally changing, uncertain and disputable as society or technology (the material), and that the traditional privileged authority of scientists is being increasingly questioned by other actors who in turn, are mobilising their own authority. I draw on Latour (1998b), who sets ecology within the concept of modernisation – where we modernise, we must now ecologise – to suggest that a new form of political activity needs to be developed. The precautionary principle (or prudence) as a management response to sustain the Patagonian toothfish also needs to be considered as problematic, and procedures for politico-scientific action need to be applied if sustainable outcomes are to be produced. I also draw on Serres (1995) and his discussion on our misconceptions of time and what is contemporary to explain that the precautionary principle does not mean that humans stop taking action until certainty about the consequences of any action is known because this stance assumes that humans are capable of becoming masters of certain knowledge. On the contrary, nature, society and the precautionary principle reside “in the permanent maintenance of the impossibility of folding” and there will always be permanent and continuous conflict that forbids any mastery (Latour 2002: 258). In addition, I explore whether co-constructions that make up the actor-network, including the changing influence of NGOs, lead to any sudden reformation of the actor-network when power relations are revealed, degenerate or re-negotiated. I draw on Goodman (1999) who applies ANT to explore how NGOs and civil society voice their ethical and material concerns where:

... the biopolitics of green social movements and environmental NGOs are articulated from ethical principles whose ontological foundations are diametrically opposed to those underlying mainstream social science disciplines ... the next step would be actor-network approaches to nature-society co-productions ... which give greater prominence to interrelationships between nature, social justice and the construction of alternative socio-ecological futures.

⁴⁹ Spaces of prescription could be considered as Euclidean spaces where space is fixed and absolute.

2.2.3 Actors and networks

Applying ANT involves describing evidentiary procedures for each inquiry (Kendell & Wickham 1998: 97) that involves the merger of semiotic entity building; the development of a methodological approach to record the heterogeneity of such a building; and an ontological claim on the character of the *networky* of actors themselves (as described by Latour 1998c). For example, I needed to look for signs and symbols in the form of texts, maps, data and other inscriptions to identify what actor-networks were *connected* to the Patagonian toothfish and how they exerted power on other actor-networks.⁵⁰ In this investigation, actors have no essential characteristics and are able to mobilise an actor-network of allies to do work. They act upon something, are granted activity by others, or make other actors dependent upon them by translating their will into a language of their own in an effort to define past, present and future power relations.

Therefore, the *Patagonian Toothfish Network* has a shifting alliance of actor-networks that mobilise through series of transformations, translations, or transductions, where local interactions are tied into various webs of relations that are *connected* on a far wider scale or at a distance (see, for example: Cordella & Shaikh 2006; Holm 2001; Latour 1987; 1997; 1998a, c; Law 1986; Murdoch 1998; 2000; Rose & Jones 2004). For example, although the Patagonian toothfish and consumers are located at a distance to one another, consumers are able to enrol, convince and enlist traders to purchase toothfish products from producers who in turn enrol, convince and enlist fishers to extract the fish from the Southern Ocean. Here, consumers can enter or leave the actor-network depending on their desire to eat toothfish products, and market demand can impact the number of fishers, producers or traders in the industry. In addition, there is no difference between an actor and a network because a person, animal, text or other is nothing without their actor-network (see also Erlendsson 2001; Law 2000b; Schultz 1998; Stadler 1997a).⁵¹ For example, what is this actor-network without the Patagonian toothfish, fishers, fishing vessels and technologies or consumers? In addition, actors such as fish do not necessarily require speech or intentionality and their importance does not depend on the size of, and position within, the actor-networks; nor does the size of the actor-network depend on the number of actors it can mobilise (Callon 1986). One actor-network is never bigger than another because each actor-network is merely longer or more intensely connected (Callon & Latour 1981).

Entities that comprise actor-networks can also be converted into inscriptions and devices. These important *immutable mobiles* can be moved inside an actor-network to

⁵⁰ Some researchers use the word “actant” to overcome traditional anthropogenic connotations where all actors are *levelled up* to the status of humans traditionally associated with the word actor (see Basden 2002; Castree & MacMillan 2001; Gomart & Hennion 1999; Latour 1998c).

⁵¹ For Latour (1998a), ANT is often misconstrued and misused and four elements are problematic: the words actor, network and theory and the hyphen that sometimes links them. For him, *actors* should not play the role of agency and *network* should not play the role of society.

link those at the centre of an actor-network with distant entities, events, spaces or places (over varying times) and influence other actor-networks by transforming power relations whilst remaining stable and unchanged (Holm 2001; Latour 1987; 1990; Murdoch 1997a Tatnall & Gilding 1999). For example, money is a highly mobile *immutable mobile* that is transferred between human actors in the actor-network to represent the quantity and economic worth of toothfish products. In addition, the Internet (that is a networked entity of computers that includes the World Wide Web, email and media services) links many distant actors and networks (see Featherstone & Burrows 1995; Inkinen 2001) and together with other written and visual inscriptions, they are able quickly to disseminate information on the Patagonian toothfish, identify illegal fishers and vessels, distribute public policy and laws, detail and facilitate trade activity, and publicise events or activist conservation positions to a range of human actors.

Data are also important because their abstractions (numbers, categories, representations and other forms) cross political and non-political domains, can help actor-networks to remain free or to provide stability and recurrence to the knowledge resources available, permit action at a distance, and “enable actions to be taken which may promote outcomes that somehow accord with these knowledge forms” (Murdoch 2000: 506).⁵² Data can also help governmental actor-networks to be grounded and implemented, and lead to patterns of government regulation and normalisation across spatially dispersed locations when data are pulled towards the State’s *centres of calculation*. In this investigation, other textual *immutable mobiles* are also described such as: mobile scientific or political data that can be removed from what they represent; images that are stable, optically consistent with what they represent and able to retain their shape; maps that can be scaled differently, or reshuffled and combined, without changing the internal proportions of what they represent; and inscriptions and communications that are able to be reproduced and distributed easily.

2.2.4 The black box

A black box is any setting, no matter how complex or contested its history has been, where “many elements are made to act as one” and the actor-network becomes so stable that it is considered as fact and only the input and output becomes important (Latour 1987: 131). Here, social, environmental, scientific or technical works can be made invisible by their own success though the evolution of a black box and the more entities that can be put inside it, the broader the construction becomes (Latour 1999a). However, actor-networks can also “be compared to a black box that contains a network of black boxes that depend on one another both for their proper functioning” because if the lid of the *actor box* were opened, it may consist of other complex associations (Callon 1987:

⁵² Data permits governments to act at a distance because they are able to “pull accurate information about the world towards the state’s *centres of calculation*” (Murdoch 2000: 506).

95). Ultimately, black boxes provide the means to simplify the socio-natural-material world because they can replace complex arrangements or systems that are too multifaceted to be fully explained or represented (Goodman 1999; Kendell & Wickham 1998; Rudy & Gareau 2005; Selman & Wragg 1999; Tatnall & Gilding 1999). Although they can never be closed and are always unreliable and unstable, they can be used when analysing issues or processes they ultimately hide (say like an IGO, government authority, a computer or the biology of the Patagonian toothfish) but do not necessarily understand, question how they work or detail in the research process.

Explanations lead to the identification of black boxes. The larger the actor-network and the more heterogeneous it becomes, the more the individual actors are interrelated and the more complex and stable the actor-network becomes (Stadler 1997a). Stability is achieved when actors are held in the network by many *connections* and reluctant to break their *connections* within the network because they seek to maintain their power. If the *connections* are broken divergence may occur.⁵³ As associations emerge, the links established between the actors enrolled in the network allow power to flow down the chain towards the sole, ultimate or head-actor (macro-actor), elevating its status above all others (Callon 1986). The factors determining the elements, stability and reach of an actor-network remain internal to it, and all actors are involved to a larger or lesser extent. For example, what is a fisheries manager without the Patagonian toothfish, fishers, or RFMO? The office from which this manager operates also contributes to the actor-network as does the office equipment and the manager's salary.

The biggest and most successful constructions are those created by assembling many black boxes (Vandenberghe 2002), identifying macro-actors who are positioned on the top of each black box and a relatively problematised set of shared interests (Kendell & Wickham 1998; Selman & Wragg 1999). Micro-actors may transform into macro-actors when they stabilise particular power relations by associating the largest number of irreversibly linked elements and become seated on top of one or more black boxes (Callon & Latour 1981; Wood 2001). Actor-network stability not only results from the "durability of the bonds that hold it together, but also because it is itself composed of a number of durable and simplified networks" (Tatnall & Gilding 1999: 958). Solidity then results from a structure where each point is at the intersection of two actor-networks; one actor-network simplifies and another simplifies it. Ultimately, the actor-networks in this investigation are defined in relation to one another or other things that vary in space or time; they are multiple and relentlessly heterogeneous and are connected by nodes in the actor-network that has many dimensions.

⁵³ Note that individual actors are often reluctant to break their connections held in the actor-network because, as previously stated, what is X without Y or Z.

2.2.5 Unsettling actor-network theory

ANT is different from naturalism, ethnography, grounded theory, case studies and action research.⁵⁴ For example, naturalism and ethnography are extended by ANT because society is not merely perceived as being part of the human world made by people, but is part of an actor-network where actors and networks influence each other. Researchers do not need to consider one actor-network as context for another because networks, enrolments and actors are considered equally. Similarly, ethnomethodology overplays the localisation of action where researchers describe the world as *they make sense of it*. ANT looks beyond the *blind spot* (Tatnall & Gilding 1999) and does not exclude the negotiations from actor-networks elsewhere, differences of scale, time or how power is extended (Murdoch 1997b).

Grounded theory has some similarities to ANT in that it embraces multiple actor-networks and emphasises temporality and process. However, it calls for “an exploration of each new situation to see if they fit, how they might fit, and how they might not fit” (Strauss & Corbin 1994 in Bryman & Burgess 1999c: 81). Grounded theorists have perspectives on, and interpretations of their own and other human actors and actions. Multiple perspectives must be systematically sought during the research enquiry that is socially based where multiple *voices* are coded and compared. The researcher needs to consider *innate* properties rather than properties arising out of negotiation (Tatnall & Gilding 1999: 963). Murdoch (1997b) rejects the idea that social life is arranged into levels in grounded theory because there are no divisions between the spatialised interactions and the frameworks that organise these interactions. ANT is also different from case studies because boundaries are only established as the investigation of the negotiations involved unfolds and the association of actors in the network are positioned in the research inscription. Unlike action research, it does not focus on making the researcher *better* in developing a process or system because it is not necessarily concerned with the emancipation of the researcher in the study although it can describe the success or failure of actor-networks, and series of negotiations or innovations of systems (Tatnall & Gilding 1999).

Despite the arguments in favour of applying an ANT approach, Ezrahi (2005) and Wood (2001) question the feasibility of using such a *comprehensive* approach because it

⁵⁴ Naturalism operates on a positivist assumption that social reality is out there ready to be naturally reported by the researcher as it *really is* (Golden-Biddle & Locke 1993; Lincoln & Guba 1985b). Ethnography complements naturalism because it focuses on detailed and accurate description rather than explanation. Grounded theory is a general qualitative methodology for developing knowledge that is grounded in data systematically collected and analysed (see Annells 1996; Dey 1999). It combines a naturalist approach with positivism or post-positivism (Denzin 1998) to develop a “systematic set of procedures” (Babbie 2002: 290). Intrinsic, instrumental and collective case studies focus attention on understanding the dynamics present within a single case where prior boundaries are set and combine data (see Bradshaw & Stratford 2000; Mitchell 1983 in Bryman & Burgess 1999b; Platt 1988; Stake 2000). Action research focuses on the practise and links between social theory and problems in participatory, practical, collaborative, critical and reflexive ways (Kemmis & Wilkinson 1998).

may fail to reach commonsense outcomes or may justify inaction. For Fine (2005), the problem with ANT is that description can be endless and fluctuate between minute descriptions of the particular and abstract generalisation. Callon (1997: 1) also admits that this approach has shortcomings that centre on it “being everything but a theory – which explains why it cannot explain anything!” For Goodman (2001: 193) it is criticised because its “unswerving adherence to the methodology of generalised symmetry makes it an ineffectual social critique.” Marsden (2000: 28) states that although it provides some “refreshing methodological insights” that focus on the micro-analytic, it is unable to produce substantial theory, and Fine (2004: 336) argues that it is primarily selective and chaotic description that is lacking in causal theory and reflective accounts “for what it chooses to describe.” Castree and MacMillan (2001) also warn that this *approach* may not be able to distinguish reality when it portrays all things as equal. In addition, Stadler (1997a) cautions that although actor-networks can be so stable and large that they appear to be independent from other actor-networks, this may be a misconception because actor-networks always require actors and although any actor is replaceable, it can only be replaced by another actor. Finally, Castree and MacMillan (2001) query whether each actor-network is unique and question the merits of starting each investigation afresh despite any similarities between actor-networks.

Important criticisms are levelled at the ways in which actor-network researchers treat actors symmetrically, render power relations equal (particularly considering that social affairs often direct outcomes), and might weight actor-networks and include only those *necessary* in order to complete an investigation pragmatically. Pickering (1993 in Murdoch 1997a) argues that humans differ from nonhumans because they have intentionality, whereas nonhumans have performance or behaviours. He sees intentionality as a *sticking point* and a mobilising force that allows certain actors to construct networks in the first place. In addition, Rudy and Gareau (2005) question how certain actors validate their right to express and represent other actors and networks. Murdoch (1997a) also refers to Collins and Yearly (1992a, b) who retain a social platform and criticise ANT for yielding to natural science, for taking a misconceived extension of symmetry where researchers are taken out from their pivotal role, and for assuming that nonhuman or inhuman can ever be accounted for in any way other than a human account. For Schultz (1998: no page) ANT may be an inappropriate tool for differentiating associations because it “potentially provides black and white pictures rather than coloured and contrasted ones.” Castree and MacMillan (2001: 222) add that although it may be liberating to reveal multiple nonhuman or inhuman actor-networks, their identification may count for little if they are described “in their subjugation to others.” Ultimately, Vandenberghe (2002: 53-54) contends that only humans and animals can act and claims that humans and nonhumans are different and “belong to different ontological regions” because “being human is being-with-others, whereas nonhumans are indifferent not only to humans, but also to nonhumans and to themselves.” However, the capacity to *act* depends on how one defines the term.

Therefore, it is not possible to determine whether the Patagonian toothfish remains indifferent to those actor-networks harvesting members of its community.

Some commentators are critical of actor-network researchers for trying to explain science in purely social or cultural terms (see Latour 1999a, b). For example, Ezrahi (2005: no page) criticises Latour's rejection of "nature as a lawful, objective realm of necessary facts" because this position fails to consider that nature as represented by science has been a powerful influence in modern democratic political culture in terms of inducing consensus, coordinating behaviour, empowering the rights of individuals and facilitating the rise of the modern press based on facts rather than opinion. Bloor (1999: 82) also criticises Latour's ideas and states that ANT does "not represent the way forward" because it adds nothing to explanation, the actor-network language is simplistic and reductionist, and it does not adequately consider human beliefs or motivations, and nor does it consider issues of inequality such as gender, race and class. For him, nature is all encompassing where society is a part of nature, and he argues that outcomes are relative and they can be causally explained. Only by maintaining a distinction between subject and object, and "driving a wedge between nature and the description of it provided by the knowing subject" can researchers highlight the problematic character of those descriptions (Bloor 1999: 94). In his words, Latour's realist mode that "takes nature as the cause of accurate descriptions of herself" is "false" because "while nature may appear to talk straight to the believer", we cannot "just endorse the agent's own perception of things" (Bloor 1999: 105-106).⁵⁵

However, Latour (1999b) rejects these criticisms and states that ANT was never intended to be *the way forward*. He asserts that both nature and society should be co-constructed and that driving a wedge between the two is a contradictory task because it severs what the researcher wants to glue together. He recommends a complete and innovative reworking of the origin of nature because "no scrutiny of nature can be carried out if we first believe in nature as the obvious background of all our assumptions about it" (Latour 1999b: 128). Instead of restricting themselves to modernist illusions of *mononaturalism* and *multiculturalism*, researchers ought to embrace the idea of *multinaturalism* where a complex collectivism is determined not by outside experts (such as authority or scientists) claiming absolute reason, but by diplomats who are flexible and open to experimentation (Latour 2004: 211-219). Murdoch (1997a: 747) also argues that when thinking about intentionality, researchers need to consider other forms of reflection besides language and human-centred accounts because "the problem of intentionality is essentially one of cause." Notably, Star (1991) counters criticisms of inequality, injustice and intentionality by considering that there are always misfits between the needs or shapes of individual actors and standardised, conventional actor-

⁵⁵ Hacking (1999) also suggests that although ANT's descriptive methodology maybe useful, it needs to recognise the particular characteristics of human actions.

networks.⁵⁶ She contends that illegality and marginality are powerful experiences and humans can always occupy in-between spaces because “we are all marginal in some regard, as members of more than one community of practise” (Star 1991: 52). Therefore, there is no blueprint for marginality or intentionality in the actor-network (whether it is the distinction between licensed and illegal fishers or responsible and irresponsible States managing and/or harvesting the stocks) that holds in all situations as the traditional sociologists would propose. The innovative and unpredictable nature of actor-networks allows for new enrolments that are slightly different from those previously, which in turn, opens up spaces for new forms of resistance. Therefore, it is unnecessary for all actor-networks to have the same capacity to enrol others, nor is enrolment necessarily deliberate or voluntary (Lockie 2002).

To overcome criticisms of ANT, I reflect upon Schultz (1998), who recommends specifying the types of trajectories that are obtained through highly different mediations after having thoroughly traced the actor-network constructions and relational ordering. I also reflect on Murdoch (1997a), who suggests describing actor-networks along their full extent to ensure they do not require any *external* cause or *internal* motivation. In this sense, I use ANT only as an *approach* to illustrate that it is feasible to visualise actor-networks connected to the Patagonian toothfish, and to comment on the realities of the respondents. Importantly, I do not adhere to this approach mercilessly and use it to consider actor-networks or issues that may otherwise remain hidden in the investigation (such as the intrinsic value of the Patagonian toothfish to nature and society). I draw on Castree and MacMillan (2001: 222) who advocate taking a “weaker version of ANT”; and remain critical about how this approach might be applied to this investigation, with its binarist thinking, generalised symmetry, limited conceptions of agency and centred conceptions of power. Despite this wariness, I hope to learn something from these social constructionist approaches to nature to describe the actor-network and develop more inclusive, just and imaginative socio-natural-material outcomes.

Finally, Law (1997; 1999b; 2000a, b), recommends that researchers not fall into functionalism when using ANT and think about relations. He warns that technological studies analysing things are reproducing functionalism and perform it into being. For him, it is possible to imagine relational orderings which produce different kinds of actor-networks and politics and he recommends new versions of analysis and politics where researchers accept responsibility for their participation in, and performances of, the world (see also Callon & Law 1995; Cordella & Shaikh 2006; Orlikowski 2005). *Semiotic performativity* needs to be applied ruthlessly to all actor-networks where entities achieve their form (or agency) as a consequence of their performances “in, by,

⁵⁶ Star (1991) counters criticisms of inequality and injustice in her study of standardised and universal actor-networks and the delivery of standardised fast-food packages such as McDonald hamburgers. After asking for a hamburger without onions, she disrupted the flow along the *McDonald's Hamburger Network*, and had to wait for over 30 minutes for her fast-food order.

and through those relations” in which they are located (Law 1999b: 4). For example, rather than accepting the authoritative power exerted by CCAMLR and its members as being absolute in the *Patagonian Toothfish Network*, I also consider the power exerted by non-state actor-networks. These actor-networks include fishers, NGO representatives, consumers, the general public, the fish and I as the researcher, and collectively, we are all influential on the actions of CCAMLR and its members. However, given that nothing is certain in the actor-network, I also need to produce accounts that not only include the key actor-networks but also present observations that are believable and robust enough to negate the twin charges of “symmetrical absence and symmetrical absurdity” (see McLean & Hassard 2004: 493).

2.3 Qualitative research approach

2.3.1 Documentary research

To construct the *Patagonian Toothfish Network* and assess actor-network stability, I used a qualitative research approach.⁵⁷ Initially, I conducted documentary research that consisted of a comprehensive review of the literature. Primary and secondary inscriptions were sourced to study the research controversy at a distance and gain research credibility.⁵⁸ Literature searches were undertaken electronically via the Internet, and at various libraries based in Hobart, Australia including the University of Tasmania, CCAMLR, Australian Antarctic Division (AAD) and Commonwealth Scientific and Industrial Research Organisation (CSIRO) – Division of Marine and Atmospheric Research. Some of the key search terms used included: research paradigms, ANT, organisations structures, Patagonian and Antarctic toothfish, CCAMLR, fisheries management, ecosystem management, sustainability, IUU fishing, bycatch, IGO, NGO, international relations and global governance. In addition, a number of international articles I co-authored during the period of this investigation, which focus on sustainability in the Southern Ocean fisheries, the Patagonian toothfish and research methodology, are cited in the text.⁵⁹

Many other sources of published material were also sought and included a wide range of public records and documents such as books, research reports, parliamentary reports, journal articles, data records, statements, letters, newspaper articles, Internet sources, committee minutes, photographs, films and video. In addition, unpublished and often private documents were obtained from governmental officials, IGOs, NGOs and the

⁵⁷ Qualitative research tends to emphasise and interpret multiple meanings rather than seeking to impose any one dominant or correct interpretation (Glesne & Peshkin 1992; Winchester 2000).

⁵⁸ For Van House (2001), examining inscriptions makes the study of action at a distance possible and is central to the process of gaining research credibility. Written material may include primary sources that are produced first hand by the people studied and consist of reports, minutes, contracts, proposals, memoranda or autobiographies (see also Bryman & Burgess 1999a; Hodder 2000; Strauss & Corbin 1994). Alternatively, secondary sources provide commentaries or summaries of the original sources.

⁵⁹ See: BOI. (2004); Fallon & Kriwoken (2003a, b, 2004; 2005); Fallon & Stratford (2003a, b, forthcoming); Kriwoken *et al.* (2006).

fishing industry. Given that these records and documents were “often highly chunked and contextualised” (Hodder 2000: 714), I sought to present the information in an ethical and plausible manner by presenting *truth* as I saw it, by accurately sourcing material used the dissertation, including direct quotations from key informants, and by considering whether the material was authentic, credible or representative or if it provided relevant meanings that were truthful and/or valid by cross-referencing it with other data sources.

2.3.2 Ethical considerations

This investigation draws on interviews and participant observations that include personal, political and/or commercial-in-confidence information. Therefore, given that it is infused by ethical, social and political considerations, I had a responsibility to the research subjects, my colleagues, myself and the research itself (see Bryman & Burgess 1999a; Erikson 1967; Rossman & Rallis 2003). Consequently, I submitted a comprehensive *Human Research Ethics Application* to the University of Tasmania Social Sciences Ethics Committee that subsequently approved this research (Reference number: H0006986).

Importantly, the interviews potentially involved ethically sensitive issues and the key informants would be identifiable particularly with regard to the small number of international fishers in the Patagonian toothfish fishing industry. Therefore, the anonymity of key informants could not be guaranteed and their voluntary informed consent was sought prior to commencing each interview. An *Information Sheet* and *Consent Form* were developed and all key informants were asked to read the *Information Sheet* and sign the *Consent Form* before participating in the research (Appendix A).⁶⁰ Key informants were advised that their involvement was entirely voluntary, they could withdraw at any time without prejudice and interview information would be treated as confidential, but their anonymity could not be guaranteed.

2.3.3 Semi-structured interviews with key informants

Once the field-work research methods were developed, I sought access to both closed- and open-research settings (see Bryman & Burgess 1999a; Gans 1968). The political sensitivities of this research contributed to this being a difficult and protracted process that required careful negotiation by telephone, in-writing and in-person. I needed to consider formal and informal *tests* the subjects placed upon me in order to gain and maintain acceptability in the research settings, and the “role of good fortune and sheer tenacity” in gaining access to these settings was vital to undertake this investigation (Bryman & Burgess 1999a: xvi).

⁶⁰ All citations that appear in the Appendices are detailed in the Reference List.

I draw upon qualitative data in the form of interactive, in-depth, semi-structured and open-ended key informant interviews because the subjects provide particular and important perspectives on networks of action on fishing for the Patagonian toothfish in the Southern Ocean.⁶¹ They are human actors who provide information and are defined by their position in the actor-network and relationship to me as the researcher. These data were not intended to be representative of the total international toothfish management community, fishers or others who form part of the actor-network. They were used as a natural concomitant to provide an understanding about the issues considered as important to the respondent actor-network. Qualitative purposive sampling was utilised to select respondents that were *especially informative* and snowball sampling was used where others referred subjects (see Fallon & Kriwoken 2003a, b; Gilchrist 1992; Minichiello *et al.* 1995; Neuman 2000; Singleton & Straits 1999). In this sense, they provide both access and sponsorship to the investigation and some become research collaborators when they recommend other informants or help to translate the data both literally and figuratively. Although I attempted to discover the respondent group's culture, shared sense of reality or differences, I also imposed particular ways of understanding reality upon informants' responses (see Gilchrist 1992; Holstein & Gubrium 1997). For Pool (1957: 192-193) information is filtered by both the respondents and the researcher, and every interview is an "interpersonal drama with a developing plot" that provides an opportunity to construct, not merely discover or convey information.

Respondents included senior executives of international fishing companies, representatives from IGOs, toothfish fishery managers and compliance officers, scientific experts, NGO representatives and members of the general public. To ensure that "detail, complexity and differentiation did not overwhelm the research", the respondent group was limited (Massey & Meegan 1985: 153) and they were chosen because they had specialist knowledge about the research topic (Gilchrist 1992). A total of 70 subjects responded between 2002 and 2005 and they are initially identified as belonging in up to six actor-network categories: (1) science actors; (2) state actors; (3) IGO actors; (4) NGO actors; (5) industry actors; and (6) CCAMLR actors (Table 2.1). Their details appear in the *Personal Communications List*. Interestingly, most have a complex involvement in the management, conservation, harvesting or trade of the Patagonian toothfish and only 10 respondents fall into a single actor-network category. For example, many scientists, researchers and NGO representatives fall into multiple actor-network categories such as being employed by governments as state actors. As state actors they may be involved in national CCAMLR delegations and other CCAMLR fora, or provide advice to and be involved in IGO fora. Fishers and industry operators may also be included on national CCAMLR delegations or invited to participate in IGO fora.

⁶¹ Key informant interviews are "special forms of conversation" that provide "empirical data about the social world by asking people to talk about their lives" (Holstein & Gubrium 1997: 105).

Table 2.1: Respondents by place of origin and actor-network category

Name	Country	Actor-network category					
		Science	State	IGO	NGO	Industry	CCAMLR
Aarskog, R.	Argentina				.	.	
Agnew, D.	United Kingdom	.	.	.		.	.
Akkers, T.	South Africa		.				.
Albin, J.	La Réunion Is. ¹				.	.	.
Anonymous	New Zealand				.	.	.
Bartholomew, M.	New Zealand		.				.
Brownstein, C.	United States				.		
Carter, D.	Australia				.	.	.
Chapman, S.	Australia		.				.
Che, B.	Australia				.		
Clark, B.	United States			.	.		.
Constable, A.	Australia	.	.	.			.
Crowe, G.	Australia		.				
Dahl, A.	Switzerland	.	.	.			
Davis, J.	Australia		.				.
Exel, M.	Australia			.		.	.
Galbraith, B.	Australia		.				.
García, M.	Chile	.	.	.	.
García, S.	Italy	.	.	.			
Gascón, V.	Spain			.	.		.
Gilbert, N.	New Zealand	.	.				.
Gilman, E.	Hawaii	.			.		
Goldsworthy, L.	Australia				.		.
González, E.	Chile	.	.	.			
González, M.	Argentina				.	.	
Graham, A.	Australia			.	.	.	.
Grieve, C.	United Kingdom				.	.	
Hall, H.	Falk. Is./SGSSI ²		.				.
Hanich, Q.	Australia				.		.
Hansen, H.	Falkland Islands				.	.	
Haward, M.	Australia	.					
Hay, I.	Australia		.				.
Hodder, J.	Australia		.		.	.	
Kavanagh, A.	United States			.	.		.
Kock, N.	S. A./Namibia ³				.	.	
Leadbitter, D.	Global (Aust)				.	.	

Name	Country	Actor-network category					
		Science	State	IGO	NGO	Industry	CCAMLR
Lee, M.	United States				•		
Marín, Y.	Uruguay	•	•				
Marschoff, E.	Argentina	•	•				•
Miller, D.	Global (Aust)	•	•	•			•
Molenaar, E.	The Netherlands	•	•				•
Molloy, J.	New Zealand		•		•		
Moore, M.	Australia				•		•
Moreno, C.	Chile	•	•				•
Nagle, W.	Australia		•			•	
Neave, P.	Australia		•				
Nichols, D.	Australia	•					
O'Brien, V.	Australia		•				•
Patchell, G.	New Zealand				•	•	•
Pérez, R.	Spain				•	•	•
Pyke, C.	Australia					•	
Reuillard, E.	La Réunion Is. ¹		•				•
Richardson, G.	Australia		•				
Richey, S.	Australia		•		•	•	
Robertson, G.	Australia	•	•				
Robertson, J.	Falkland Islands				•	•	
Rose, B.	South Africa				•	•	•
Sainsbury, K.	Australia	•	•	•			
Sawle, R.	Falkland Islands				•	•	
Scott, L.	Australia				•	•	•
Slocum, G.	Australia		•				•
Smith, T.	Alaska				•	•	
Stevens, J.	United States				•		
Stevens, M.	United States				•		•
Tuck, G.	Australia	•	•				•
Watson, P.	United States				•		
Williams, D.	Australia				•	•	
Williams, R.	Australia	•	•				•
Willock, A.	Australia			•	•		•
Wimmer, S.	Australia		•	•			•

¹La Réunion Islands/France; ²Falklands/South Georgia and South Sandwich Islands; ³South Africa/Namibia

Table 2.2 details a profile of the respondent who are evenly spread across actor-network categories. Approximately half are located in Australia and half are located internationally in 16 places of origin. Half are state actors and half are non-state actors. Approximately one quarter of the respondents fall into four key actor-network categories: (1) scientists and researchers; (2) government officials and fishery managers; (3) NGO representatives and members of the community; and (4) fishers and industry operators. In addition, approximately half the respondents are, or have been, CCAMLR delegates and of those attending CCAMLR meetings, just over half are state actors (Figure 2.1: page 53).

Notably, due to the secretive nature of the Patagonian toothfish fishing industry, it was difficult to identify and contact fishers and industry operators. In addition, the potential failure to gain the trust and support of, and elicit respondent comments from, fishers and industry operators were identified as considerable weaknesses in the study by my supervisors prior to commencing the investigation. However, a unique component of the study in global terms is the successful inclusion of fishing industry respondent data. To my knowledge, this has rarely, if ever, been achieved for a specific international fishing industry sector. For this reason alone, some Patagonian toothfish fishery managers and industry representatives consider the investigation to be internationally important.

Table 2.2: Respondent profile (n = 70)

Total Sample	Variable	Frequency	Percentage
Respondents	State actors	34	49
	Non-state actors	36	51
Actor-network category	Scientists and researchers	14	20
	Officials and fishery managers	19	27
	NGOs and community	18	26
	Fishers and industry operators	19	27
	CCAMLR delegates	37	53
CCAMLR	Non-CCAMLR delegates	33	47
	CCAMLR state actor	20	54
	CCAMLR non-state actor	17	46
Nationally based / International	Australia	33	47
	International	37	51
Place of origin	Argentina	3	4
	Chile	3	4
	Falkland Islands	3	4
	La Réunion Island / France	2	3
	New Zealand	5	7
	Italy	1	1.3
	South Africa / Namibia	3	4
	South Georgia and South Sandwich Islands	1	1.3
	Spain	2	3
	Switzerland	1	1.3
	The Netherlands	1	1.3
	United Kingdom	2	3
	United States	9	13
	Uruguay	1	1.3

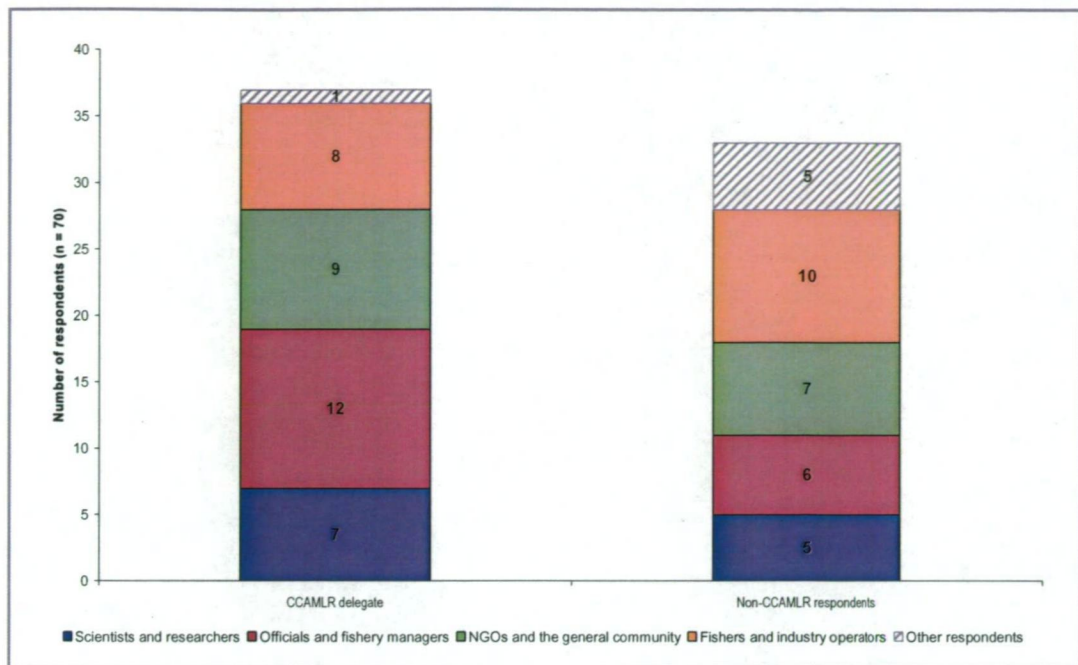


Figure 2.1: Respondents participation in CCAMLR meetings (frequency of respondents per actor-network category n = 70)

Given that respondents had vastly different perspectives about the research topic, the interviews were tailored to draw out rich information where they could freely express their ideas and opinions for each subject (see Minichiello *et al.* 1990; 1995; Morse 1994; Robinson 1998; Singleton & Straits 1999). They were conducted face-to-face, by telephone, by email and in writing. Prior to each interview, respondents were provided with an *Information Sheet* describing the nature and purpose of the research (Appendix A). Respondents were then invited to participate in the research and were asked to sign a *Consent Form* to confirm their participation and ensure that they were aware of the political sensitivities of the topic (Appendix A) (see Chapter 2 Section 2.3.2). Those who agreed to take part were then asked up to 15 open-ended questions in an interview that lasted approximately 60 minutes. An individual schedule was developed for each interview to ensure the specific expertise and perspective of the informant was elicited although a number of structural questions were included to focus the inquiry (see Gilchrist 1992; Patton 1990). Interview questionnaires were also translated into Spanish to allow respondents with Spanish as their principle language to participate (Appendix A). All interviews were recorded on tape or in writing and transcribed verbatim.⁶²

⁶² The literature provides little direction to guide researchers in ensuring transcription quality or “identifying, monitoring, or limiting different types and sources of transcription errors” (Polard 1995: 13). They need to consider: proxemic communication that considers attitudes; chronemic communication that uses pacing of speech and lengths of silences; kinesic communication including body movements and postures; and paralinguistic communication including variations in pitch, quality and volume of voice (Holstein & Gubrium 1997; Polard 1995). However, given the interactional nature of communication in this research, that many interviews were not conducted face-to-face, and possible deliberate or unavoidable alterations to the data are difficult to identify, the emotional context of the interviews was not evaluated because it might be potentially misleading because it may be subject to my own interpretation.

Interview transcripts were sent to the respondents for verification and revision where necessary. I sought permission to cite material and where personal communications appear in the dissertation, those interviewed have granted permission for their use. However, given the political sensitivity of some issues related to the Patagonian toothfish and IUU fishing activities, informants were advised of their right to some anonymity. One respondent specifically asked to remain anonymous, and two respondents provided valuable information but asked to remain completely *invisible* and they are not presented in the demographic profile.

2.3.4 Participant observations

Participant observation was undertaken to complement the research and assist in interpreting and verifying the theoretical approach, documentary research and respondent findings (see Becker 1958; Bryman & Burgess 1999a; Hughs 1960; Kearns 2000; Patton 1990).⁶³ This method allowed me to determine what situations participants ordinarily met and how they behaved in them. Given that “social reality is built-up in an ongoing conversation between people” (Rock 1979: 22), observing the actors *in situ* withdrew me from a contemplative stance and engaged me directly in the research. By entering the *conversation*, I became both the researcher and participant where *facts* (socially agreed interpretations of thing, actions and events) were produced in the investigation by social encounters. However, although I needed to join the groups/meetings/committees and my membership demanded a show of loyalty, this method was not an easy task because I needed to earn the trust of others. Throughout this investigation I remained psychologically on the margins of the social situations and relationships and at times, was pressured to conform (see Bradshaw & Stratford 2000; Gans 1968; Hughs 1960; Rock 1979). To elicit credibility and support, I continued to engage in conversation where I both deferred to the others’ portrayals of reality but also took into account the subjects’ credibility. Although the observational data and interpretations are difficult to present, I sought to present with probity the evidence as it came to my attention (see Becker 1958).

Observations were made at 16 Australian Government Southern Ocean fisheries management fora including open- and closed-meetings of the Sub-Antarctic Fisheries Management Advisory Committee (SouthMAC), and meetings of the CCAMLR Consultative Forum (CCF) from 2002 to 2006. I also attended out-of-session functions and a number of closed-sessions as an observer at two annual CCAMLR meetings held in Hobart in 2002 and 2003. In addition, I participated in the Tasmanian State Government Antarctic policy consultation process and provided constructive debate to

⁶³ Participant observation has often been regarded as a quintessential qualitative research method. It is described by Bryman and Burgess (1999a: xvi) as a “research method in which a researcher immerses him- or herself in social context with the aim of uncovering through an empathetic understanding the meaning systems of participants in that social context and hence see the world from their point of view.”

developing the *2004 Tasmanian Antarctic, sub-Antarctic and Southern Ocean Policy*, particularly in relation to fisheries and environmental management in 2003 and 2004.

To gain access to these closed- and open-research settings, I conducted negotiations with Mr Bill Nagle (Chair of the SouthMAC), Dr Tony Press (Director of the AAD and Chair of the CCF), Dr Denzil Miller (CCAMLR Executive Secretary) and Mr Ben Galbraith (General Manager, Antarctic Tasmania) to elicit their support. Once I was granted permission to attend these fora, I then engaged the other members of these groups (the research subjects) and compelled them to cooperate. Success was achieved in gaining their trust by using diplomacy and respect, and I rigorously met any conditions imposed upon me by them; particularly with regard to commercial-in-confidence issues. These observations improved my understanding of the internal workings of CCAMLR at the international level; national governments in their efforts to manage the Patagonian toothfish; IGOs and NGOs and their representatives' efforts to conserve and protect this species; the fishing industry and the efforts of licensed and illegal fishers to harvest and trade toothfish products; and members of the general public in relation to their consumption of this fish and motivations with regard to sustainably managing this species. Refer to Table 2.3 (page 56) for details on the committees, fora and meetings I participated in, either as an official observer, contributor or public attendee.

2.3.5 Hermeneutic data analysis

Interviews and participant observations were designed to allow for interactions to be transported (translated) out of their original spatial and cultural setting to my *headquarters* that includes the office, computer and research files. Once the interviews were complete, transcribed and combined with participant observations, translation took place through a series of summaries and combined into manageable forms such as quotations, tables, graphs and figures. These summaries allowed me to speak on behalf of the participants of the investigation. Here, both globalisations and localisations are produced within the micro- and macro- lens of the research inscription and participants have been transformed from *objects that spoke for themselves* into my own written inscriptions (immutable mobiles) and then to actors within the network. Work is stabilised in the actor-network in such a way that it can travel across space and time and be combined with other work to make meaning and significance. These descriptions are used to help explain outcomes in terms of identifying black boxes *punctuated* within wider actor-networks, and convergences or divergences in these actor-networks (see Callon 1987; Latour 1987).

Table 2.3: Participant observations conducted between 2002 and 2006

Meeting	Date	Place	Comments
CCAMLR meeting – CCAMLR XXI	21 Oct 2002 - 1 Nov 2002	Hobart Observer	Made contacts and gained insights at out-of-session fora
Annual Open Public Meeting of SouthMAC	18 Nov 2002	Hobart Public attendee	Gained insights, sought permission to attend the closed SouthMAC meeting
Sub-Antarctic Management Advisory Committee (SouthMAC 17)	19 Nov 2002	Hobart Observer	Made contacts and gained insights
CCAMLR Consultative Forum	18 Dec 2002	Canberra Observer	Made contacts and gained insights
Sub-Antarctic Management Advisory Committee (SouthMAC 18)	2 May 2003	Hobart Observer	Made contacts and gained insights
CCAMLR Consultative Forum	25 Jun 2003	Melbourne Observer	Made contacts and gained insights
CCAMLR Consultative Forum	10 Aug 2003	Hobart Observer	Made contacts and gained insights
CCAMLR meeting – CCAMLR XXII	27 Oct 2003 - 7 Nov 2003	Hobart Observer	Made contacts and gained insights at out-of-session fora
Annual Open Public Meeting of SouthMAC	19 Nov 2003	Hobart Public attendee	Made contacts and gained insights
Sub-Antarctic Management Advisory Committee (SouthMAC 19)	20 Nov 2003	Hobart Observer	Made contacts and gained insights
Tasmanian Antarctic Policy Consultation Sessions – Antarctic policy development	17 Nov 2003 - 21 Nov 2003	Hobart Contributor	Provided input into the <i>2004 Tasmanian Antarctic, sub-Antarctic and Southern Ocean Policy</i>
Tasmanian Antarctic Community Policy Forum – Antarctic policy development	4 Feb 2004	Hobart Contributor	Provided input into the <i>2004 Tasmanian Antarctic, sub-Antarctic and Southern Ocean Policy</i>
Sub-Antarctic Management Advisory Committee (SouthMAC 20)	25 Mar 2004	Canberra Observer	Made contacts and gained insights
CCAMLR Consultative Forum	16 Jun 2004	Melbourne Observer	Made contacts and gained insights
CCAMLR Consultative Forum	24 Sep 2004	Hobart Observer	Made contacts and gained insights
Annual Open Public Meeting of SouthMAC	17 Nov 2004	Hobart Public attendee	Made contacts and gained insights
Sub-Antarctic Management Advisory Committee (SouthMAC 21)	18 Nov 2004	Hobart Observer	Made contacts and gained insights
Sub-Antarctic Management Advisory Committee (SouthMAC 22)	26 May 2005	Hobart Observer	Made contacts and gained insights
Sub-Antarctic Management Advisory Committee (SouthMAC 23)	17 Nov 2005	Hobart Observer	Made contacts and gained insights
CCAMLR Consultative Forum	16 Mar 2006	Hobart Observer	Made contacts and gained insights

The emphasis of the respondent comments data was also upon insight and understanding with an analysis of meanings as they related to the research topic rather than with a formulation of generalities for all world fisheries (Robinson 1998). Thematic analysis and analytic induction of the respondent interviews were undertaken to allow for ideas to emerge from the data as they were collected (see Holstein & Gubrium 1997; Manien 1990; Minichiello *et al.* 1990).⁶⁴ Data coding commenced at the beginning of the fieldwork and categorisation of the data into themes was repeated frequently in light of the analysis being an *iterative process* (Rossman & Rallis 2003). I then examined the transcripts and extracted the concepts, themes and issues. Preliminary analysis of the interviews enabled me to focus questions in light of any outcomes and revise propositions before conducting the next interview (Minichiello *et al.* 1995). A hermeneutic and humanistic approach was adopted where “the extraction of meanings in a process of interpretation” identified each respondent’s experiences, intentions, actions and feelings (Robinson 1998: 410) (Appendix B).⁶⁵ I was also reflexive and considered my own role and interface with the interviews because the different decisions I made on what to count inevitably implied different answers to the questions and placed different emphasis on the data (Neuman 2000).⁶⁶ Importantly, I allowed respondents to speak for themselves and verbatim quotations are included in this dissertation.

When drawing on interview material, each respondent is allocated a number (e.g. Respondent #). In particular, I use randomly allocated numbers for each fishing industry respondent, but *no relationship is inferred between numbers and names* in order that I comply with ethical considerations to protect the anonymity and confidences of these respondents. This approach does not affect my hope that the findings will be significant first for those engaged in the management of the toothfish fisheries, second for others dealing with IUU fishing in other fisheries, and third for those involved in the international governance of the global commons more generally.

An actor-network approach was then used to develop ANT constructions, map the *Patagonian Toothfish Network* and explore the research findings as detailed in Section 2.4. A new method of actor-network analysis has been developed in this investigation in the form of overlay maps that are presented as a series of radar graph transparencies. The overlays identify, predict and assign relative significance to the key issues impacting upon the Patagonian toothfish fisheries, key strategies to curb IUU fishing

⁶⁴ Interviews are traditionally analysed thematically on accurate descriptions of experience that involves “coding, grouping, summarising and providing a clear framework that encapsulates and explains aspects of the social world” (Holstein & Gubrium 1997: 118). It is not necessarily a “rule-bound process but a free act of seeing meaning” where themes provide control and order to the research (Manien 1990:79).

⁶⁵ Hermeneutics involves human understandings and the interpretation of texts that moves beyond written documents to include visual images, speech, events or works of art. Researchers discover meaning embedded in the text although each reader brings subjective experience to that task (see Bernstein 1983; Neuman 2000).

⁶⁶ The different decisions I make on what to count as data will inevitable imply different answers to the questions and place different emphasis on literal, interpretative or reflexive data.

activities and advance sustainable toothfish fisheries, and actions in support of the key strategies that respondents commented upon.⁶⁷ Overlays detailing the responses of each key actor-network category were derived from the thematic analysis of key interview data. The superimposed overlays emphasise key issues, strategies and actions, but also to expose other hidden issues and agendas.

Analytic induction was also used to analyse the participant observation data. I used critical interpretation where descriptive themes were identified and comparisons were made between interviews and participant observations. Findings were used to help identify actors in the actor-network and cross-reference the truthfulness and validity of other data sources.

To ensure validity and trustworthiness when conducting the interviews and participant observations, I considered if the research appeared faithful to the participants and undertook member checks where the analysis was recycled back to the respondents. I also searched for disconfirming evidence that involved prolonged engagement with the participants and integrated both conflicting and complementary information. Triangulation was used where multiple data sources, multiple methods and various records were included to verify findings (see Chapter 1 Section 1.1.1). Finally, rich descriptions were applied to ensure that generalisability and transferability of findings as they related to the research topic (see Bloor 1978; Goodman 2001; Lincoln & Guba 1985a in Bryman & Burgess 1999d). A thorough description of the assembly, coordination and durability of the actor-network within which the inquiry took place is subsequently detailed. In summary, this research embodies “deconstructive verisimilitude” where multiple *masks* or versions of the real are examined to show how each version impinges on and shapes the phenomenon being studied (see Denzin 1994: 317).⁶⁸ Here, a poststructurally conceived form of validity is my *mask* of authority which permits a particular version of *truth* or the *real* to the text.⁶⁹

2.3.6 Limitations

Considering that researchers must “evaluate both the adequacy of their reasoning and the actuality of their statements” in terms of the reliability, validity and trustworthiness of their research, and given the strengths and weaknesses of the data sources used in this investigation, I considered the limitations of the research (Singleton & Straits 1999: 43).

⁶⁷ Used in environmental planning since the 1960s (McHarg 1968), overlay mapping shows the degree of environmental impact on a feature in an easy to use and understandable form (see Glasson *et al.* 1995; McHarg 1968). Overlays may include geographical features, watersheds, human settlements, environmental impacts, culturally significant sites or composites. In this investigation they map respondent responses.

⁶⁸ *Verisimilitude* is the ability to reproduce and map the real to ensure validity (Denzin 1994).

⁶⁹ Poststructurally conceived forms of validity include: ironic legitimisation that proliferates multiple representations; paralogical legitimisation that foregrounds dissidence and heterogeneity; voluptuous legitimisation that images the feminine; and rhizomatic legitimisation where multiple voices speak to present nonlinear texts and multiple centres as embodied by ANT (see Denzin 1994; Lather 1993).

First, using a single actor-network presents a significant limitation due to its sheer complexity. Other issues arise with regard to the representativeness of the actor-network and the extent to which it is able to provide a challenge to the fit of theory. Limitations of representativeness can also be extended to intensive qualitative research and although the data may provide causal relationships that maybe generalisable to other contexts, concrete patterns are unlikely to be representative (Bradshaw & Stratford 2000).

This research investigates real-world situations and does not seek to manipulate the research setting (see Babbie 2002; Denzin & Lincoln 1998, 2000). It uses documentary analysis, interviewing and participant observations. However, each method has its own strengths and weaknesses. For example, documents may be incomplete or inaccurate, or they may be subject to measurement errors or political influence; and interviews can only represent respondent perspectives at the time they were undertaken and are necessarily perspectural. In addition, when I directly enter the setting my enrolment into the actor-network possibly results in me accidentally *manipulating* the research settings (particularly when asking questions, conducting interviews, attending meetings or making observations).

I was also aware that my selection of respondents was a subjective process that could potentially lead to errors or omissions in the findings (see Denzin 1994; Rossman & Rallis 2003). Given the highly political nature of this study, many potential subjects also chose not to participate, and others chose to remain anonymous. However, to reduce uncertainty and errors, and to promote reliability, rigour and trustworthiness, I used triangulation and a multi-method approach to validate and cross-check findings through multiple perspectives that overcame the limitations of a single research focus.⁷⁰ Professional advice and comments were also sought from relevant government departments, private industry and academic bodies when developing the methodology. In addition, all stages of the research were documented to ensure research transparency (including in the research methodology, data collection and data analysis), and I conducted all aspects of the research process to ensure consistency. As part of this process, interview transcripts were verified with respondents to confirm any interpretations and verbatim respondent quotations are included in this dissertation to ensure the accuracy of the respondents' views. Interview and participant observation findings are related to the literature and fit within other contexts outside the study situation. Finally, work was submitted for checking by University of Tasmania supervisors, government agency officials, industry representatives and the participant community.

⁷⁰ Denzin (1994) questions if researchers can capture or mirror a *real* world out there by carefully transcribing and analysing research data and asks: who is the subject, are they representational and do they have direct access to his or her lived experiences? For him, critical poststructuralism challenges these assumptions because language and speech create experiences rather than mirror them, and this process of creation transforms and defers what is described. Therefore, there can never be final or accurate representations of what is said because respondent statements are always in motion and convey a textually constructed presence.

2.4 Patagonian Toothfish Network constructions

2.4.1 First order approximation

As a node of access into this investigation, I start with the entry into force of the Convention on the Conservation of Antarctic Marine Living Resources in 1982, the efforts of CCAMLR members to manage and conserve Antarctic marine living resources, the simultaneous discovery of commercial Patagonian toothfish stocks off the Kerguelen Islands in 1985 by Soviet Union fishing fleets, and the subsequent over-fishing and IUU fishing activities that have impacted upon these stocks since this time. These developments have led to the establishment of an abstract, but complex, actor-network of human, nonhuman (natural) and inhuman (material) actors that are loosely framed in the first order approximation of the *Patagonian Toothfish Network* (Figure 2.2: page 61). These actors are part of the social, natural and material worlds, they have become connected in the actor-network through their association with the Patagonian toothfish, and their identity is established by the links that form in-between them. For example, links are formed by *scientific knowledge* that has been produced and certified by actors who have come together to investigate commercial toothfish stocks; numerous *social groups* who have come together to harvest, trade, manage, conserve or protect the species; and *new technologies* that have been developed to assist the activities of various actors. This first order approximation of the actor-network (after Wynne 1992; Murdoch 1997a) is a type of black box because the processes that give rise to the actor-network are hidden from view.

This general approach forms the basis of the following actor-network investigation because it examines the Patagonian toothfish and how it is translated or passed from hand to hand during its harvest, trade and consumption or through the efforts of actors to manage, conserve and protect this species. Here, nonhuman and inhuman actors have a voice and are not erased from human (social, political or cultural) landscapes. The following discussion aims to open up this black box to show how it is built.

Human actor-networks associated in this actor-network range from CCAMLR and its members, governments, licensed and illegal fishers, scientists, IGOs, and NGOs to the general community, artists/writers and various other researchers. Nonhuman actor-networks range from the Patagonian toothfish to the Southern Ocean, Antarctic toothfish and other marine species that inhabit these waters. Inhuman actor-networks are also integral to this actor-network and they range from various inscriptions including the Convention on the Conservation of Antarctic Marine Living Resources, other international conventions, national laws, policies, conservation measures and procedures to the negotiations themselves and all the entities that exist in the fora where they take place including committees, workshops, groups and meetings, data and/or information, other texts and images, and media and communication facilities including letters, memos, emails, newspaper articles, and radio and television broadcasts.

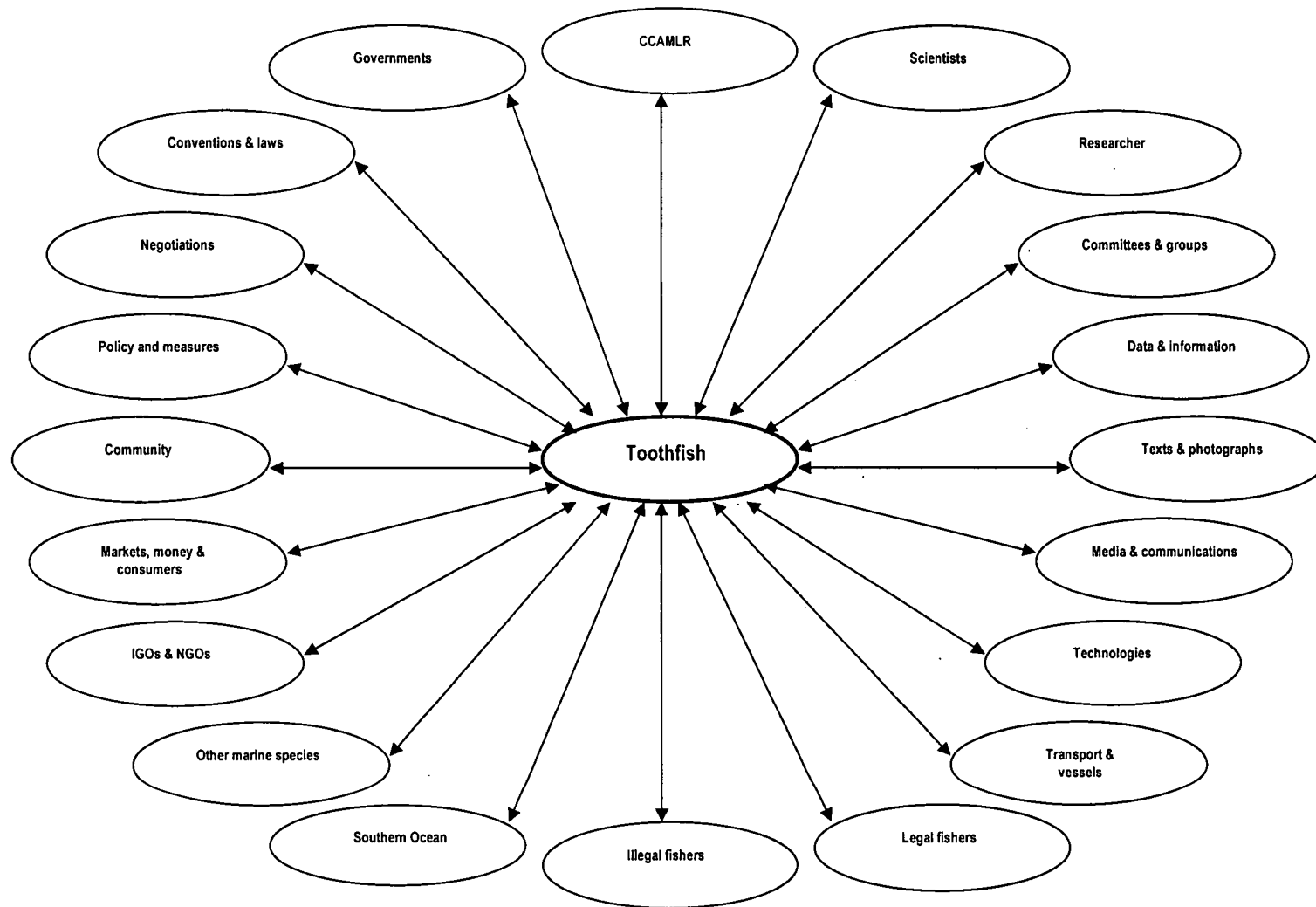


Figure 2.2: First order approximation of the *Patagonian Toothfish Network* comprising human, nonhuman and inhuman actor-networks

In addition, inhuman actor-networks include technologies that range from fishing, satellite, compliance, enforcement and communication technologies, fishing, surveillance and transport vessels to infrastructure and market facilities that enable the trade and consumption of this fish. Finally, money and funding sources form a critical actor-network that comprises of highly mobile *immutable mobiles*.

Philosophically, some commentators might consider that the management and conservation of the Patagonian toothfish is centred on nature. For example, social constructivists may assert that managing, harvesting or consuming toothfish products is about certain social actor-networks conforming to the culturally produced image of what marine exploitation is supposed to look like. With this in mind, I consider that the Patagonian toothfish is both natural and social and this fish is established as an outcome of the harvesting-management-trading-consuming-conservation-protection process. There is no predetermined assumption as to whether sustainably managed Patagonian toothfish fisheries are one or the other in the manner of the environmental realists or social constructivists. Here, the processes impacting upon the Patagonian toothfish are predominantly ones of hybridity involving multiple and indissoluble links connecting the fish; Southern Ocean and other marine species found in these waters; fishers; CCAMLR members; other governments and their authorities and committees; scientists; IGOs and NGOs and their representatives; traders, consumers; the wider community; and the various technologies and inscriptions.

Given the complexity of the *Patagonian Toothfish Network*, this investigation makes *concrete* 10 key actor-networks as illustrated in Figure 2.3. Hereafter, three key actor-networks are state actors (CCAMLR members, national governments [and their officials and scientists] and IGOs); five key actor-networks are non-state actors (fishers, NGOs, communities and myself as the researcher); and two key actor-networks are other non-state actors (the Patagonian toothfish and Southern Ocean ecosystem). Importantly, I do not limit myself to simply identifying these actor-networks but reveal possible head-actors, network stability and the formation of black boxes, and show that the interests of these actor-networks lie in the consideration of the wider perspective that includes power relations mobilised by other material and intermediary actor-networks.⁷¹ I draw upon the interactions among the 10 key actor-networks to identify how the structures of power emerge in the *Patagonian Toothfish Network* and how these power relations help establish and maintain black boxes where more powerful actors become head-actors who speak in the name of others.

⁷¹ In his leading paper on the production of knowledge focusing on the decline of scallops and the role of fishers and marine researchers in the small French fishing area St Brieuc Bay, Callon (1986) outlines a process of identifying or contesting black boxes, actor-network stability and power relations.

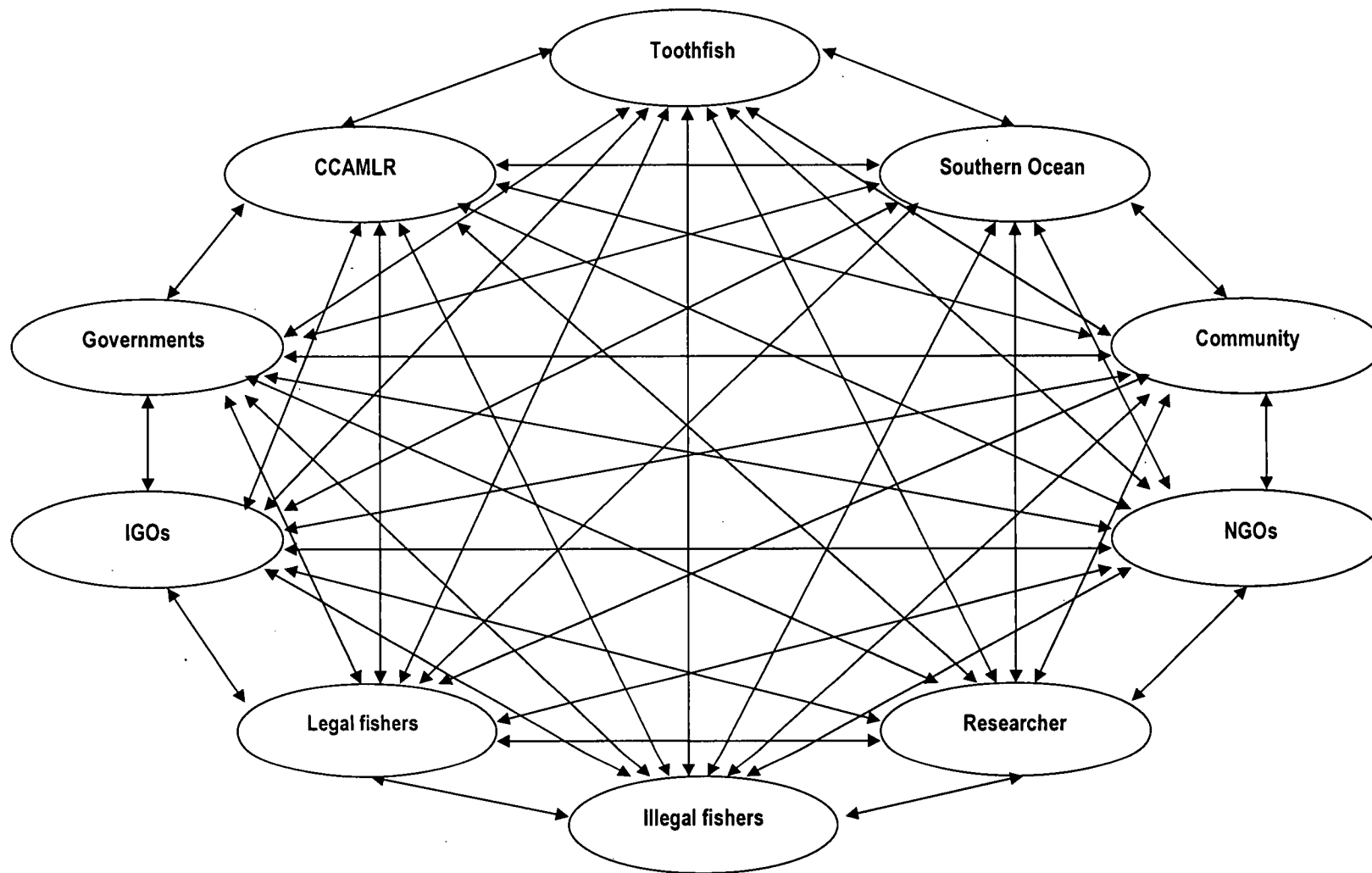


Figure 2.3: The simplified *Patagonian Toothfish Network* comprising 10 key actor-networks

2.4.2 Problematisation

Problematisation occurs when researchers establish an actor-network and define it in such a way as to establish an obligatory passage point (OPP). Actors must work through an OPP if they are to become indispensable in the actor-network and problematisation is to be established (Callon 1986; Kendell & Wickham 1998; Rose & Jones 2004; Selman & Wragg 1999). In this investigation, the problem considers that it may not be possible to manage Patagonian toothfish sustainably if it is over-fished or IUU fishing continues. The argument that the 10 key actor-networks develop here is as follows. If the Patagonian toothfish wants to survive it needs to avoid capture. Nonetheless, problems arise because other actors in the network have different motivations that conflict in a dissident way with the Patagonian toothfish's goal to remain in the ecosystem. Therefore, the problematisation processes have dynamic properties. However, in establishing the actor-network the actors need to pass through the following OPP because they cannot obtain what they want by themselves (Figure 2.4).

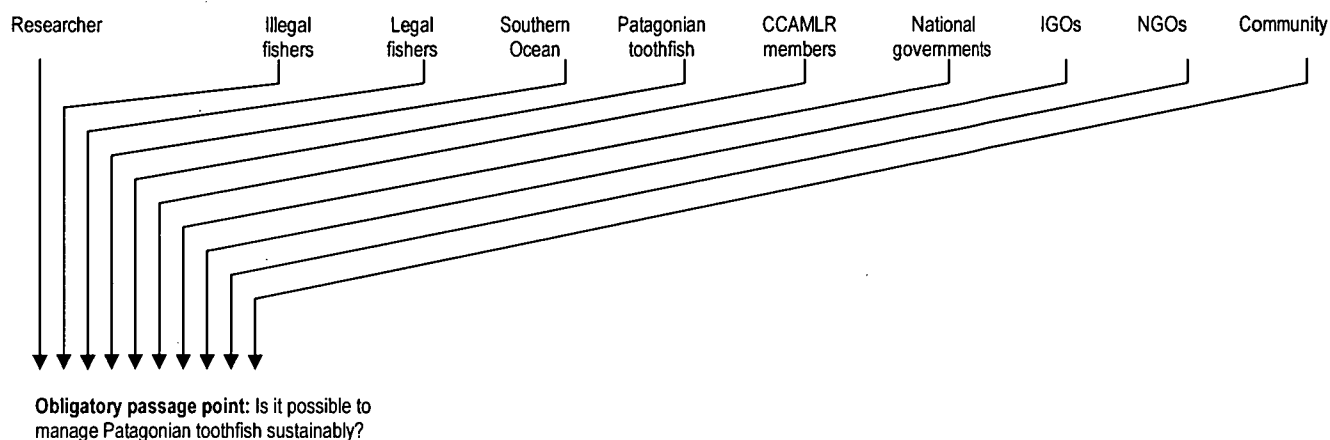


Figure 2.4: The problematisation process and obligatory passage point

The future of the Patagonian toothfish remains uncertain because it continues to be transformed into a desirable commodity by the licensed fishers (who seek long-term biological, economic and political solutions to ensure an ongoing economic resource), illegal fishers (who challenge ecological, moral and legal norms and seek short-term profits); traders who seek to maintain their markets and economic returns; and consumers who have an insatiable demand for the species. This species is also rendered uncertain by scientists who need to fish to produce knowledge and advance their careers; CCAMLR members and national governments who seek to retain their political influence in the Patagonian toothfish fishery management debate by having something to manage, conserve and protect; and IGOs and NGOs who seek to increase their power and social legitimacy by influencing CCAMLR members, national governments, fishers and the wider community. Interestingly, actors in these networks need to admit uncertainty and resistance in the actor-network. Adding to these factors, the wider community hopes that all the other human actors will simply act responsibly

with regard to managing the Patagonian toothfish sustainably whilst ensuring on going supply of the fish for consumption. The distant and hostile conditions imposed by the Southern Ocean ecosystem on fishers and others conducting research or compliance activities also imposes a continuous challenge to these actors. Finally, as the researcher, I would be unable to complete this investigation were the other actors and networks removed.

2.4.3 Interessement

In the reports and articles presented by CCAMLR members, the various government authorities, fishers, IGOs and NGOs mentioned have *real* existence because their representatives are included in national CCAMLR delegations. However, reality is also a process that passes through successive stages. In Figure 2.5, the entities and their relationships are identified but they have not been tested. Each actor enlisted by the problematisation can be either integrated into the scheme through their actions or refuse the transaction by defining its identity, goals, orientations, motivations and so forth in another manner.

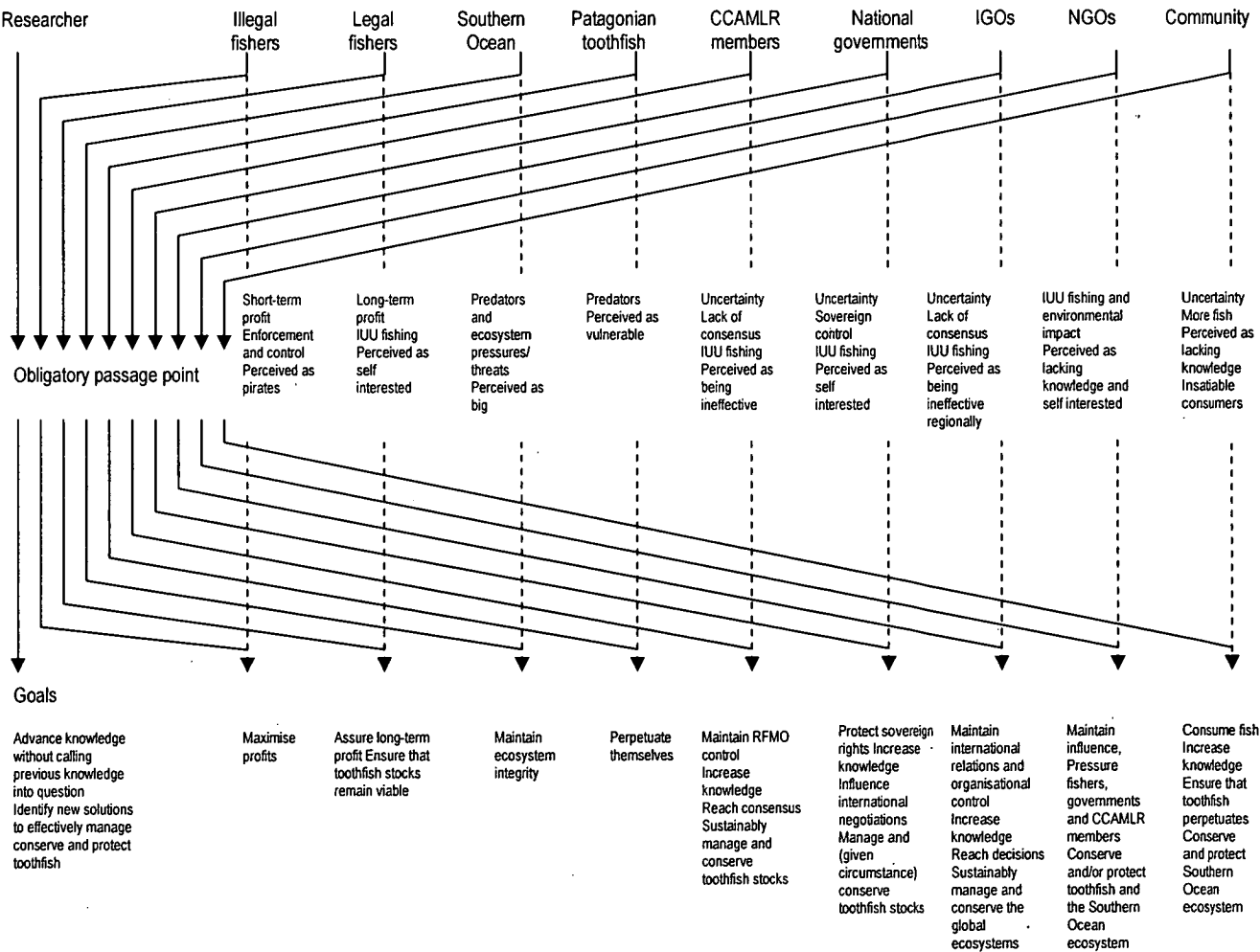


Figure 2.5: The system of alliances or associations between actor-networks, obstacles or problems between them

As such, I impose *interessement* on this group of entities and focus on the in-between by my attempts to corner and stabilise the actors that are to be enrolled and have been defined through the problematisation. For Callon (1986: 207-208), *interessement* is the “group of actions by which an entity attempts to impose and stabilise the identity of the other actors it defines through its problematisation” and by which the entity weakens the links it has with other entities. I join forces with the Patagonian toothfish, fishers, CCAMLR members, government officials, IGO and NGO representatives, and the community in order to attain my goal of finding new ways of managing and conserving Patagonian toothfish sustainably. Through this process, the actors define the identity, goals and inclinations of their allies (or adversaries) although these associations are tentatively implicated in the problematisations of all the other actors and remain competitive. Therefore, if *interessement* is to be achieved, it is important for me to focus on the in-between imposed, and build devices that can be placed between the actor-networks and all other entities who want to define their identities otherwise.

If *interessement*, is successful, it confirms (more or less) the validity of the problematisation and the alliances it implies by enrolling actors into a network. For example, in Figure 2.6, A may interest B by cutting or weakening all the links that B may have with other entities who may wish to link themselves with B. The range of strategies and mechanisms that can be used by actors and networks to bring about interruptions between actors or to give another definition is unlimited (Callon 1986). In this sense, human and inhuman actor-networks – including fishers’, vessels’, technologies, data and understandings – *extract* the Patagonian toothfish from its context; the natural actor-network that is embodied by the Southern Ocean ecosystem.

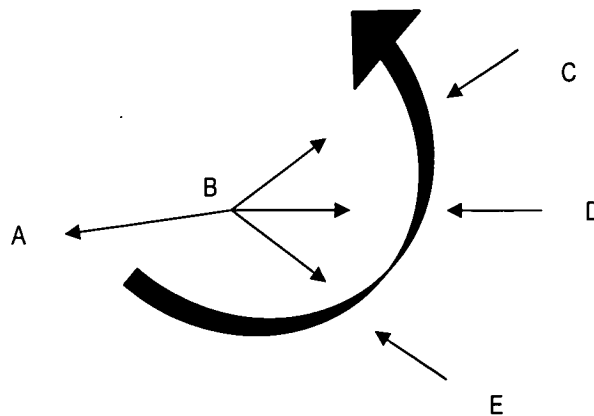


Figure 2.6: *Interessement* focuses on the in-between where A interests B by cutting or weakening the links with C, D and E (Source: Callon 1986: 208)

In addition, CCAMLR members may interest national governments to help achieve CCAMLR’s objectives at a distance by cutting or weakening all the links that national governments may have with other actors who may wish to link themselves to maximise

their efforts in exploiting the Patagonian toothfish. These actor-networks might include the Southern Ocean ecosystem, illegal fishers, rogue States, and traders and consumers of illegally caught fish. Alternatively, CCAMLR members may interest national governments to help achieve CCAMLR's objectives by cutting or weakening all the links that national governments may have with other governments or organisations that may question CCAMLR's authority or criticise its activities and outcomes.

However, it is important to recognise that the actor-networks constitute archetypal *interessement* devices and would lose their influence/effectiveness if the Patagonian toothfish *refused* to hook themselves onto longlines or be caught in trawl nets (see Callon 1986). Therefore, *interessement* is never assured and it does not necessarily lead to alliances. In addition, although fishers and fishing vessels, technology, and data and knowledge that *extract* the Patagonian toothfish from their context are necessary for *interessement* and beyond, these machinations prove superfluous for the *interessement* of licensed fishers, CCAMLR members, national governments, scientists, IGOs, NGOs, the community and the Southern Ocean ecosystem in their efforts to manage and protect Patagonian toothfish if the activities of illegal fishers compromise their efforts. Therefore, not only does the *interessement* process help corner the natural and social entities to be enrolled, it attempts to interrupt all competing associations and construct a system of alliances. This research describes these alliances and details the range of possible strategies and mechanisms that are, or could be, adopted to bring about interruptions to this actor-network.

2.4.4 Enrolment

Enrolment is when a set of interrelated roles is defined and attributed to actors who accept them through the process of translation of interests, and the engagement of these actors by using a variety of tactics (Cordella & Shaikh 2006; Kendell & Wickham 1998; Law 2000a). Within ANT, translation is a complex process that constantly mixes a variety of natural and social actors together (Callon 1986) and transfers power through them and whose mediation is indispensable for any action to occur. Chains of translation refer to the "work through which actors modify, displace and translate their own various and contradictory interests" (Latour 1999a: 311). Therefore, enrolment is precarious and the links and nodes in the actor-network do not last by themselves; and they need constant maintenance, work and the support of other links and nodes (Law 1999a). Enrolled actors are *locked* into a solid chain of translations, or conversely, they are immobilised by other actors and networks.

Successful enrolment of actors in this actor-network involves coordinating their diverse interests and capacities and enacting *strategic purification*. For example, Patagonian toothfish stocks are redefined and remade only in relation to other actors that pass between them. For example, if each Patagonian toothfish is to be enrolled into this problematisation, it must be willing to hook itself only onto longlines or be caught in

trawl nets. To achieve the successful hooking of the fish, fishers must also negotiate with the Southern Ocean ecosystem because its hostile weather and ocean conditions challenge their activities and enrol other technological actor-networks to ensure the successful capture of fish.

Given that the sustainable management and conservation of the Patagonian toothfish hinge on forging new relationships between the actors and networks, it is hoped that these relationships will lead to the eventual physical transformation for this species and institutional and social transformations for the human actors. The negotiations, initiatives and measures developed by CCAMLR members, government officials, scientists, IGO and NGO representatives and licensed fishers in an effort to manage and conserve this species sustainably is fundamental to the process because human actors attempt to set out new associations between the array of actors in the actor-network. In this light, these inhuman actor-networks and their physical manifestations either as gatherings, technology, procedures or as texts also made them key actor-networks in the *Patagonian Toothfish Network*. CCAMLR embodies these actor-networks and translates the Patagonian toothfish, the Southern Ocean and other marine species found in these waters; CCAMLR members, other governments and their representatives, scientists, authorities and committees; licensed and illegal fishers; IGO and NGO representatives; consumers; the wider community; and the various other material actor-networks into a single inscription device embodied by the annual CCAMLR report. These inscriptions are both sufficiently stable and moveable to act as common linkage points for the different actor-networks in the *Patagonian Toothfish Network*.

By explaining the relations between and among changing actors within the actor-network, it might be possible to achieve more sustainable outcomes for the management and conservation of Patagonian toothfish stocks. This possibility cannot be achieved through a single event (that may settle on one or other side of the nature-society dualism) but only through the many different associations that weave through the actor-network as a process. More broadly, there is not a single Patagonian toothfish stock that can be managed and conserved sustainably and which is to be explained, since the processes of translation and *purification* constantly change and remake the entire actor-network. Importantly, looking outside this actor-network in either nature or society, means conceding that crucial parts of the actor-network have escaped analysis.

Ultimately, the Patagonian toothfish was not social prior to its commercial discovery and eventual exploitation, but became so via the harvesting activities or the negotiations, initiatives and conservation measures that have been proposed or enacted to manage and conserve the species. Likewise, CCAMLR, its members and other management authorities, committees and groups are not institutions or groups of individuals who are *unnatural*; but have come together as a hybrid actor-network of people, oceans, fish, other marine species and other things. In particular, CCAMLR and its members became an actor-network *after the event* when a number of other actor-

networks considered that the sustainable management and conservation of the marine living resources in the Southern Ocean – including the Patagonian toothfish – was a priority. Material (or textual) actor-networks then generated additional power relations and enrolment in the actor-network. Given that it is currently possible to ascribe CCAMLR authorship to the many negotiations, initiatives and measures put forward to manage and conserve this species sustainably, it takes a leading part in the actor-network. As the other actors have taken up their roles within this actor-network, CCAMLR and its members have found themselves in authoritative new relationships that are continually shifting. CCAMLR and its members have also found that they are able to powerfully influence the actions of other human actor-networks at a distance. However, the success and agency of CCAMLR rests upon the degree to which these actor-networks connect with CCAMLR and comply with the initiatives and measures developed by CCAMLR members.

2.4.5 Mobilisation

Mobilisation renders mobile entities that were not so beforehand through a series of transformations. Representation is a key concept in the mobilisation process where I ask: who speaks in the name of whom; and who represents who (see Foucault 1979, 1991). A successful actor-network can only emerge if mobilisation enrolls all the entities and transformation takes place where actors influence others (Murdoch 1997a). Transformation can then result in the actor-network developing towards convergence and black boxes or divergence of its actors when new actors are added (Stadler 1997a; Tatnall & Gilding 1999). Therefore, transformation keeps actors involved in an actor-network by translating their own languages and values as they move toward internal agreement. It also explains how a few actor-networks obtain the right to express and represent other silent actor-networks.

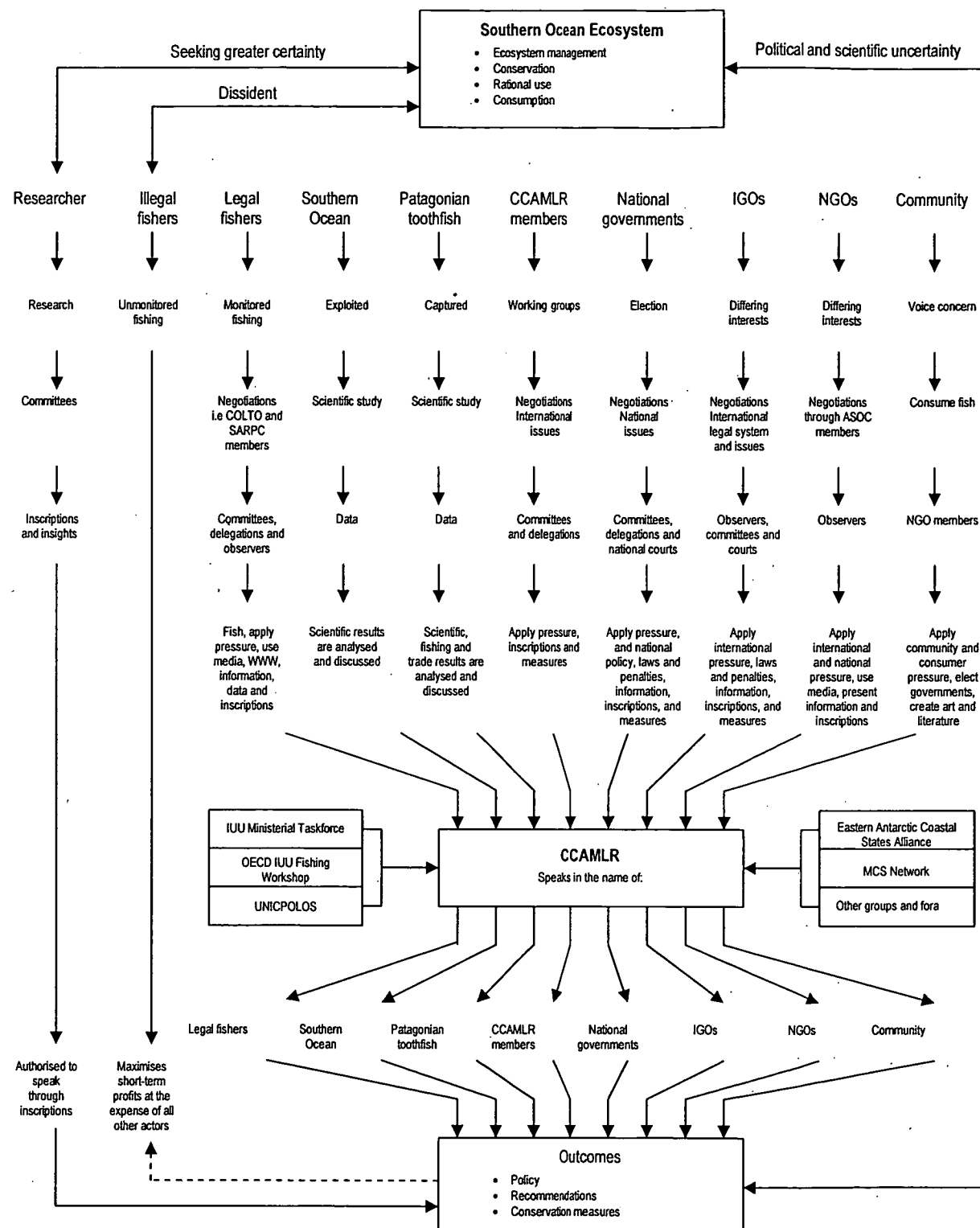
Intermediary actor-networks, (including data, inscriptions, products, services or money) become important because they provide the missing link connecting other actor-networks (Basden 2002). They define an actor-network, move between actors and networks during relatively stable transactions, and facilitate other actors and networks to communicate with one another. They confer power, impose their will into other actors and networks and translate their objectives for the actor-network's own interest. Where the coordination and optimal circulation of intermediaries is strong, the more stable and predictable the actor-network becomes and the possibility of other actor-networks being able to untie the connections in order to redefine an actor for his/her/its own purposes is weakened (Stadler 1997a). Ultimately, this process transforms into a black box where consensus between the actors occurs. In this investigation, it is my capacity to understand or command intermediaries and the translation process that lies at the centre of ANT. I also need to consider that power can be shared between the different actor-networks and that the process of enrolment and translation makes some actor-networks more powerful than others. However, it cannot be assumed that powerful actor-

networks have been the most powerful from the start of the network building process, nor will they continue successfully to exercise that power without challenge or in perpetuity. This is because, in ANT, power is relational and “an effect of successfully enrolling and representing other actors” (Castree & MacMillan 2001: 218). Therefore, representation is also a key issue in ANT and a key understanding in this investigation.

Here, I focus on CCAMLR and its role in attempting to mobilise and stabilise the identity of other actor-networks by stabilising its own links with these webs and weakening other links with *dissident* actor-networks. I also explore rationality as governing the environment (linked to space) and management action/development (linked to time) and how they can come into conflict. I draw on insights from governmentality discourse, in which politics is positioned on the boundary between state and *global civil* society, and where the actions of state actors are more or less calculated and rational activity seeks to shape that conduct through the *conduct of conduct* (see Dean 1999; Foucault 1991; Murdoch 2000). For example, if CCAMLR and its members are to act upon action, then national governments need to mobilise domains that lie outside their borders (including material actor-networks such as technologies and data) so not to crush the capacity of citizens to act. They need to use both political and non-political resources where government rationalities construct the objectives of government and individual or organisational goals are mobilised through translations into the goals of the governing actor-network (see also Kendell & Wickham 1998; Latour 1987). In this actor-network, CCAMLR is powerful because it is able to act at a distance and *speak* for many other actors and networks (including CCAMLR members, government officials, scientists, industry representatives, IGO and NGO representatives, the general public, the Southern Ocean ecosystem and fish, and other material actor-networks). To achieve its objectives the mobilisation by CCAMLR of nonhuman intermediary actor-networks (such as inscriptions, technologies and data) is critical. This chain of mixed intermediaries results in a sole, ultimate or head actor who is able to speak for the silent majority (Figure 2.7: page 71).

2.4.6 Transformation

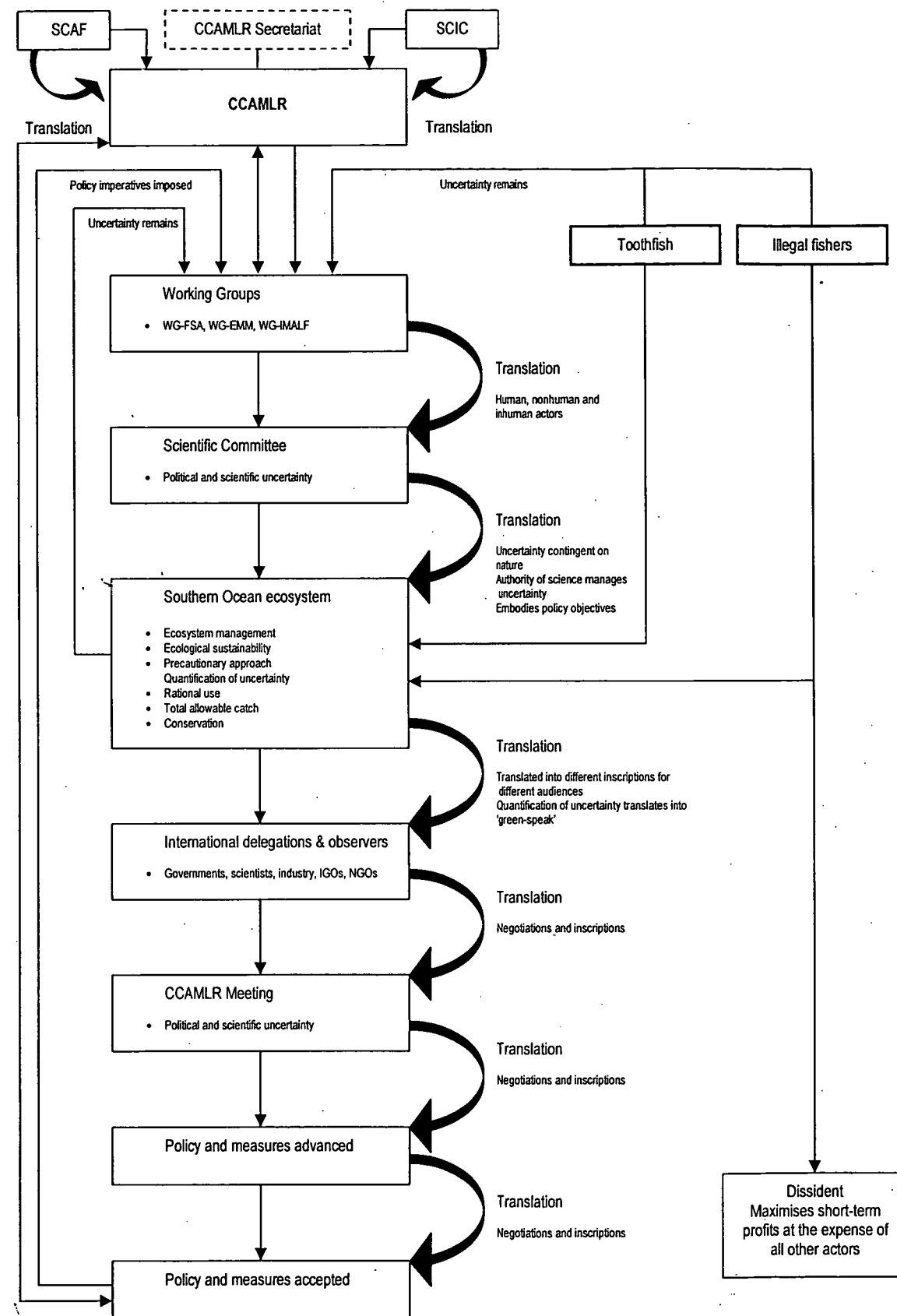
Not only are the Patagonian toothfish, Southern Ocean, fishers, national governments and wider community parts of the actor-network, CCAMLR itself brings actors together within various sub-networks (Figure 2.8: page 72). Here, government representatives, scientists, fishers and NGO observers come together as members of CCAMLR and its working groups and committees. In doing so, they try to persuade licensed and illegal fishers to harvest this species in a sustainable way by specifying a set of total allowable catch (TAC) limits and CCAMLR conservation measures by which this species ought to be harvested.



Acronym Key

ASOC	Antarctic and Southern Ocean Coalition
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
COLTO	Coalition of Legal Toothfish Operators
IGO	International Government Organisation
IUU	Illegal, unreported and unregulated
MCS Network	International Network for the Cooperation and Coordination of Fisheries Related Monitoring, Control and Surveillance
NGO	Non-governmental Organisation
OECD	Organisation for Economic Cooperation and Development
SARPC	Syndicat des Armements Réunionnais de Palangriers-Congélateurs
UNICPOLOS	United Nations Open-Ended Informal Consultative Process on Oceans and the Law of the Sea
WWW	World Wide Web

Figure 2.7: The progressive mobilisation of actor-networks (including the Patagonian toothfish, fishers, government representatives, scientists, IGOs, NGOs and the general public) where CCAMLR speaks on their behalf



Acronym Key

CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
IGO	International Government Organisation
NGO	Non-governmental Organisation
SCAF	Standing Committee on Administration and Finance
SCIC	Standing Committee on Inspection and Compliance
WG-EMM	Working Group on Ecosystem Monitoring and Management
WG-FSA	Working Group on Fish Stock Assessment
WG-IMALF	Working Group on Incidental Mortality Arising from Longline Fisheries

Figure 2.8: Sub-network A – CCAMLR and its activity

CCAMLR members attempt to build a policy and scientific actor-network by getting other actor-networks – humans, institutions and natural entities – to comply with them. As CCAMLR members link the entities together, they configure their own identities and power, and designate a set of interrelated roles. Here, CCAMLR only exists once a long chain of members has been brought together, and it speaks for others only after members have been silenced. In addition, it has become powerful because it has become the head of several entities within the actor-network, and to this extent the actor-network has become stabilised to a certain degree as a black box. Together, transformations through the chains of intermediaries elevate CCAMLR as the sole head-actor-network through the progressive mobilisation of actor-networks who make propositions credible and indisputable because they form alliances and act as a single unit of force. Therefore, CCAMLR constitutes a result rather than a starting point, and if consensus is to be achieved, the margins of manoeuvre of each actor-network need to be tightly delimited. However, Latour (1999a: 7) reminds us that reality depends on whatever the “mob thinks is right at any given time” and the actor-network can dynamically change to reflect new influences.

2.5 Convergence and divergence in the actor-network

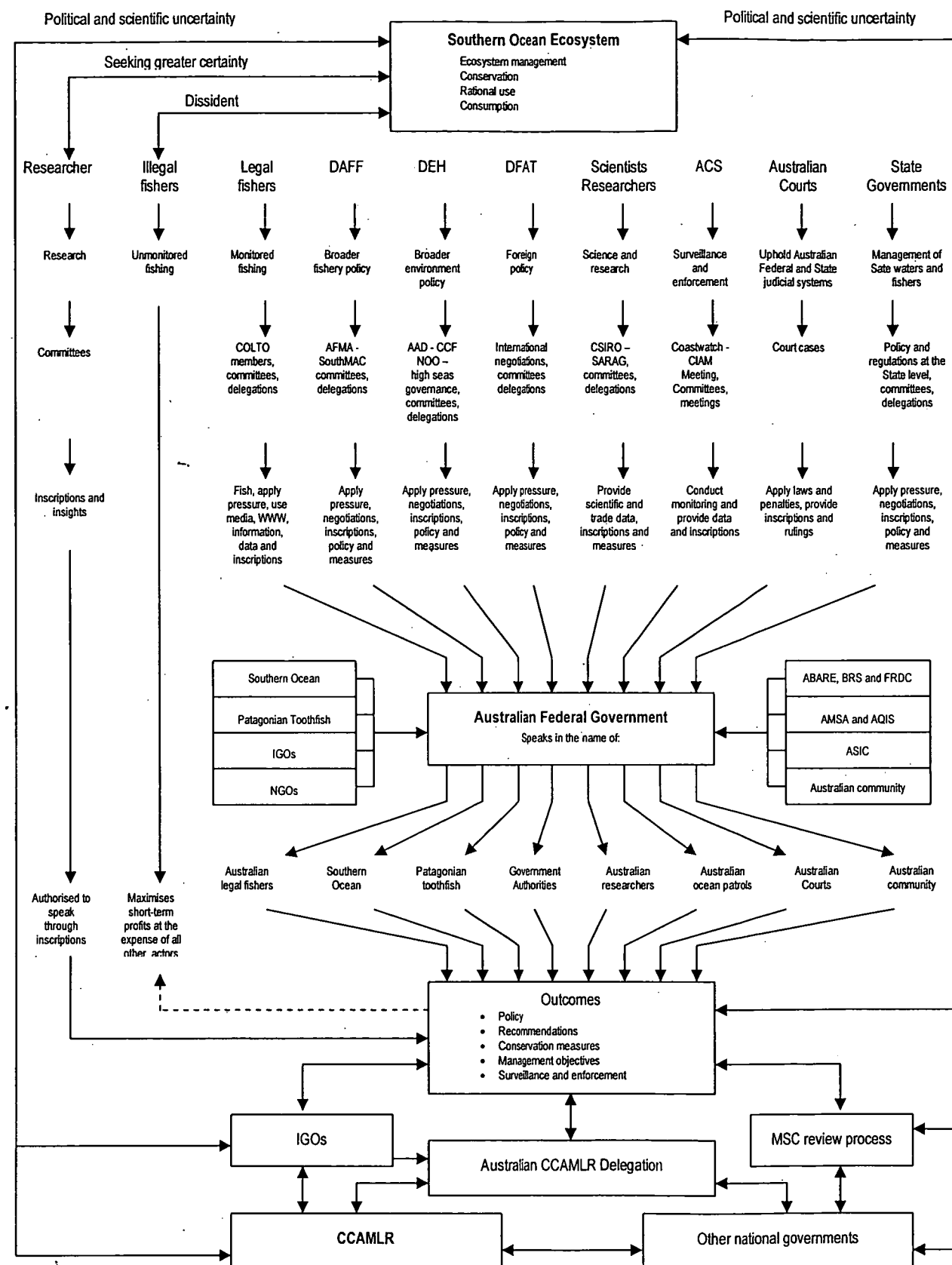
Finally, dissidence occurs when controversy is manifest and the representation of a head-actor is questioned, contested, discussed, negotiated or rejected (Callon 1986). These network building activities remain precarious given that alliances in the actor-network can be contested at any moment (Murdoch 1997a). If a head-actor is challenged or refused, new displacements take place and the actors move from the OPPs that have been imposed upon them. Betrayal occurs and new head-actors that deny the representativeness of the previous ones are heard and although translation continues, the equilibrium of the actor-network will be modified and the translation process denied.

Controversy and betrayal feature in the actor-network because some actors question whether CCAMLR and its members are successful in managing and conserving the Patagonian toothfish, or are able to act as a sole head-actor-network. These actors and sub-networks contest the *consensus* views and alliances formed by CCAMLR and adopt unambiguous and dissident roles. For example, some fishers break ranks with the intentions of their head-actor-network – whether it is CCAMLR or the government to whom they claim citizenship – in a dissident manner and fish illegally. They also compromise the efforts of other actor-networks to sustainably manage the stocks. In addition, the meaning of key phraseology such as rational use of marine resources, sustainability, conservation or effective compliance is also contested because some actors and networks consider these inscriptions as uncertain and little more than *greenspeak*. Conversely, others consider these terms as legitimate inscriptions to describe new ways of fishery management.

2.5.1 National governments

By opening up, deconstructing or unpacking the *Patagonian Toothfish Network*, I describe other sub-networks at macro- and micro-scales that form black boxes in their own right. In these ANT constructions, other actors and networks transform into head-actors through the process of transformation whereby various actors are mobilised into the actor-network. For example, national governments are powerful actor-networks in their own right. They too, are the result of a long chain of representatives and are capable of progressively mobilising other actors and networks because they speak for their authorities, scientists, fishers and citizens. At the same time, national governments often question or reject the views or actions of CCAMLR and its members whilst negotiating new initiatives and outcomes with these very same actors and networks. They can also act in a dissident manner by protecting illegal fishers or market operators operating under their sovereign control. Conversely, they may enact regulatory controls that exceed those imposed by other CCAMLR members.

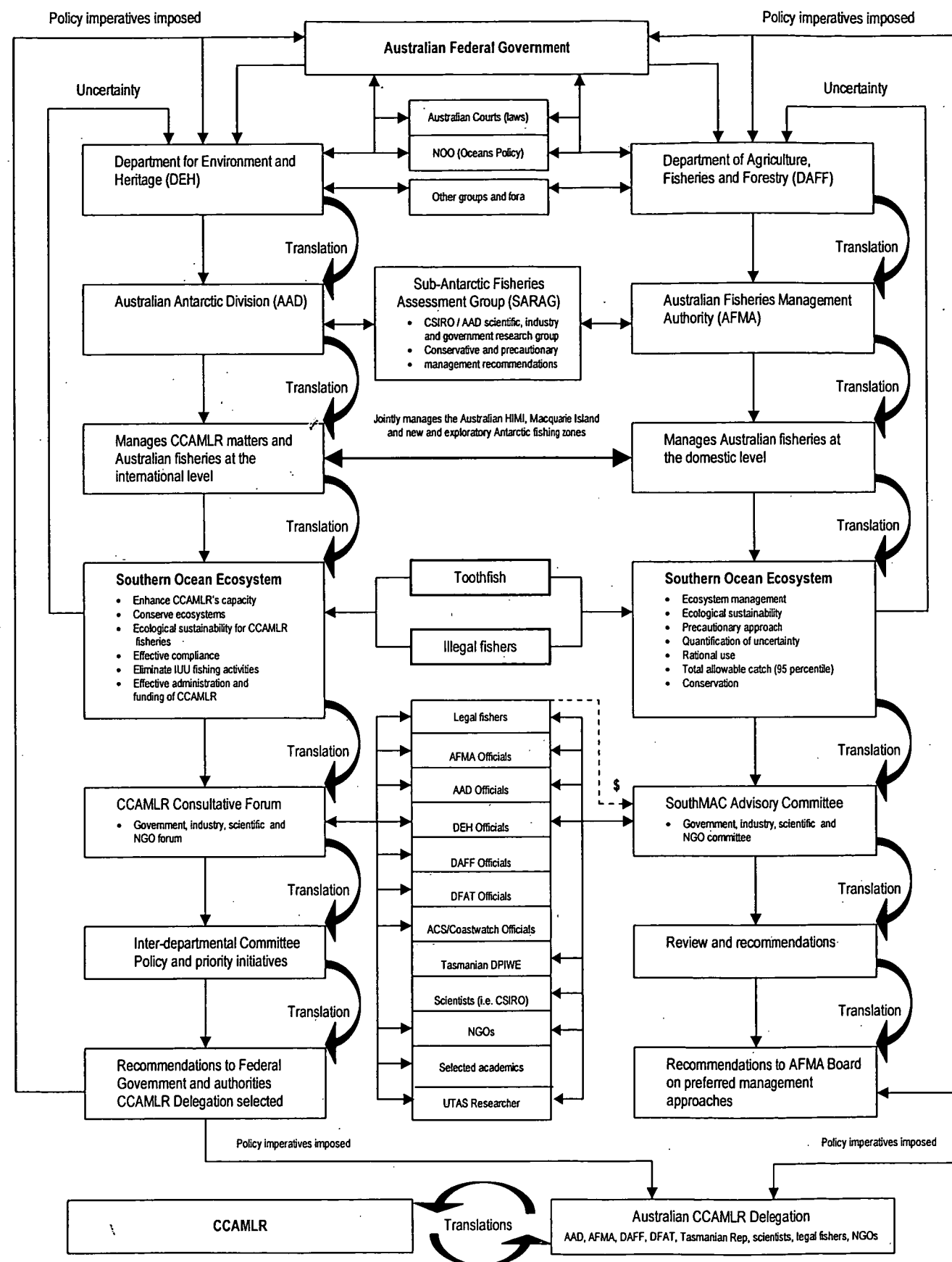
Here, I focus on Australian Federal and State governments and their efforts to manage and conserve the Patagonian toothfish, particularly those fish found in Australian territorial waters. I illustrate how a national government can become a powerful actor-network in its own right acting in both cooperative and dissident ways with other actor-networks. Figure 2.9 (page 75) details sub-network B at the macro-scale. It illustrates how the Australian Federal Government establishes its own black box in a sub-network by speaking on behalf of the Patagonian toothfish, Australian authorities, the fishing industry, scientists and researchers, the legal system, and citizens. Figure 2.10 (page 76) details this sub-network at a micro-scale in sub-network C. It describes how Australian Patagonian toothfish stocks are managed collaboratively by the Australian Fisheries Management Authority (AFMA) and AAD, and illustrates how other Australian actor-networks are directly mobilised into the sub-network through a series of translations at governmental and international levels. These actor-networks provide management and policy advice, scientific understandings and data, industry information and data or a community-led perspective.



Acronym Key

AAD	Australian Antarctic Division
ABARE	Australian Bureau of Agricultural and Resource Economics
ACS	Australian Customs Service
AFMA	Australian Fisheries Management Authority
AMSA	Australian Maritime Safety Authority
AQIS	Australian Quarantine Inspection Service
ASIC	Australian Seafood Industry Council
BRS	Bureau of Rural Sciences
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CCF	CCAMLR Consultative Forum
CIAM	Coastwatch Intelligence Analyst Meeting
COLTO	Coalition of Legal Toothfish Operators
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAFF	Department of Agriculture, Fisheries and Forestry
DEH	Department for Environment and Heritage
DFAT	Department of Foreign Affairs and Trade
FRDC	Fisheries Research and Development Corporation
IGO	International Government Organisation
MSC	Marine Stewardship Council
NGO	Non-governmental Organisation
NOO	National Oceans Office
SARAG	Sub-Antarctic Resource Assessment Group
SouthMAC	Sub-Antarctic Fisheries Management Advisory Committee
WWW	World Wide Web

Figure 2.9: Sub-network B at the macro-scale - Australian Government authorities



Acronym Key

AAD	Australian Antarctic Division
ACS	Australian Customs Service
AFMA	Australian Fisheries Management Authority
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAFF	Department of Agriculture, Fisheries and Forestry
DEH	Department for Environment and Heritage
DFAT	Department of Foreign Affairs and Trade
DPIWE	Department of Primary Industry, Water and Environment
NGO	Non-governmental Organisation
NOO	National Oceans Office
SARAG	Sub-Antarctic Resource Assessment Group
SouthMAC	Sub-Antarctic Fisheries Management Advisory Committee
UTAS	University of Tasmania

Figure 2.10: Sub-network C at the micro-scale – Federal and State government authorities

2.5.2 International and non-governmental organisations

IGOs and NGOs can also become head-actor-networks in their own sub-networks and stabilise the wider *Patagonian Toothfish Network*. For example, the Coalition of Legal Toothfish Operators (COLTO) speaks for licensed fishers; and the environmental federation of activist and activist-oriented scientific groups, ASOC, speaks for a diverse range of conservation groups globally; and both speak for the wider *global civil society*. In addition, the UN General Assembly speaks for its 191 member countries. It also consults internationally with NGOs through the Department of Public Information (DPI) and is influential in Southern Ocean affairs (UN 2004). Many of the UN representative bodies, including the FAO, OECD, United Nations Environment Program (UNEP), International Court of Justice and International Tribunal on the Law of the Sea, exert their influence in the actor-network in providing the legal framework for protecting the Southern Ocean high seas environment and regulating the use of the oceans through various conventions, codes of conduct, agreements, plans of action and international court rulings.

The role of these actor-networks is detailed in sub-network D at the macro-scale (Figure 2.11: page 78). Here, active fishing industry alliances, IGOs and NGOs in the management, conservation and protection of the Patagonian toothfish are described (Appendix G). Notably, ASOC is not a sole head-actor-network that speaks for all the other industry alliances, IGOs and ENGOS in the actor-network. Although other actors and networks may cooperate with ASOC on issues relating to the Patagonian toothfish, they also act in a dissident manner when following their own aims, objectives or separate campaigns. For example, the ENGO Sea Shepherd operates as a dissident lone operator when conducting aggressive enforcement activities against illegal fishers. Conversely, given that ASOC is a *watchdog* in Antarctic and Southern Ocean issues, this coalition may also act in a dissident manner towards other ENGOS by not inviting them to become members of the organisation.

Many IGO and NGO representatives influence national governments and CCAMLR members directly through their representations on national government committees, inclusion on national CCAMLR delegations or as IGO and NGO official observers at CCAMLR meetings. Figure 2.12 (page 79) deconstructs the sub-network further at a micro-scale in sub-network E and describes the translations that associate fishing industry, IGO and NGO alliances. Overall, the members of 18 key environmental, industry and scientific NGOs that have exerted, or are exerting, influence are described. I also investigated various fishing industry associations from around the world and over 100 other ENGOS that are involved in the Patagonian toothfish controversy.

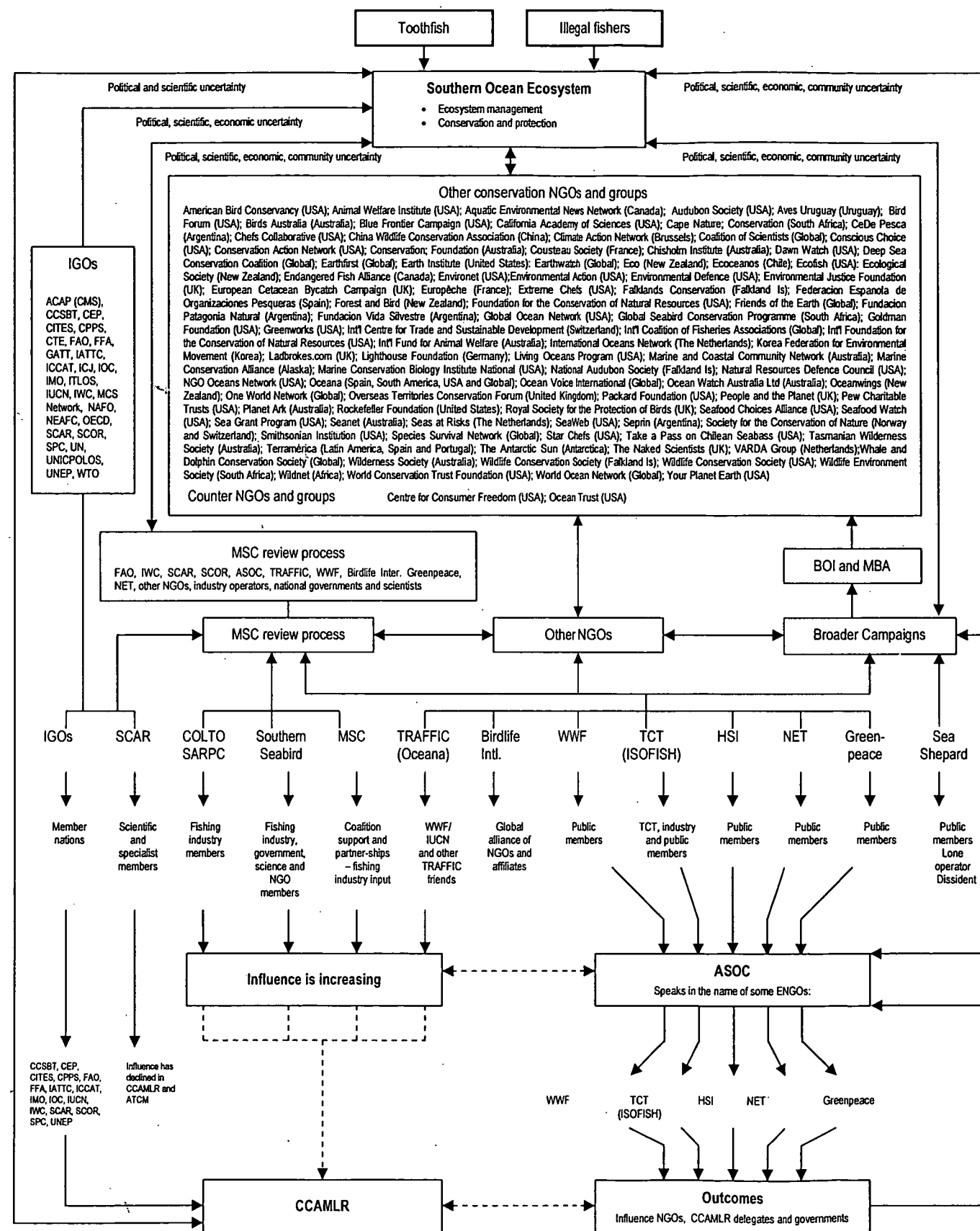
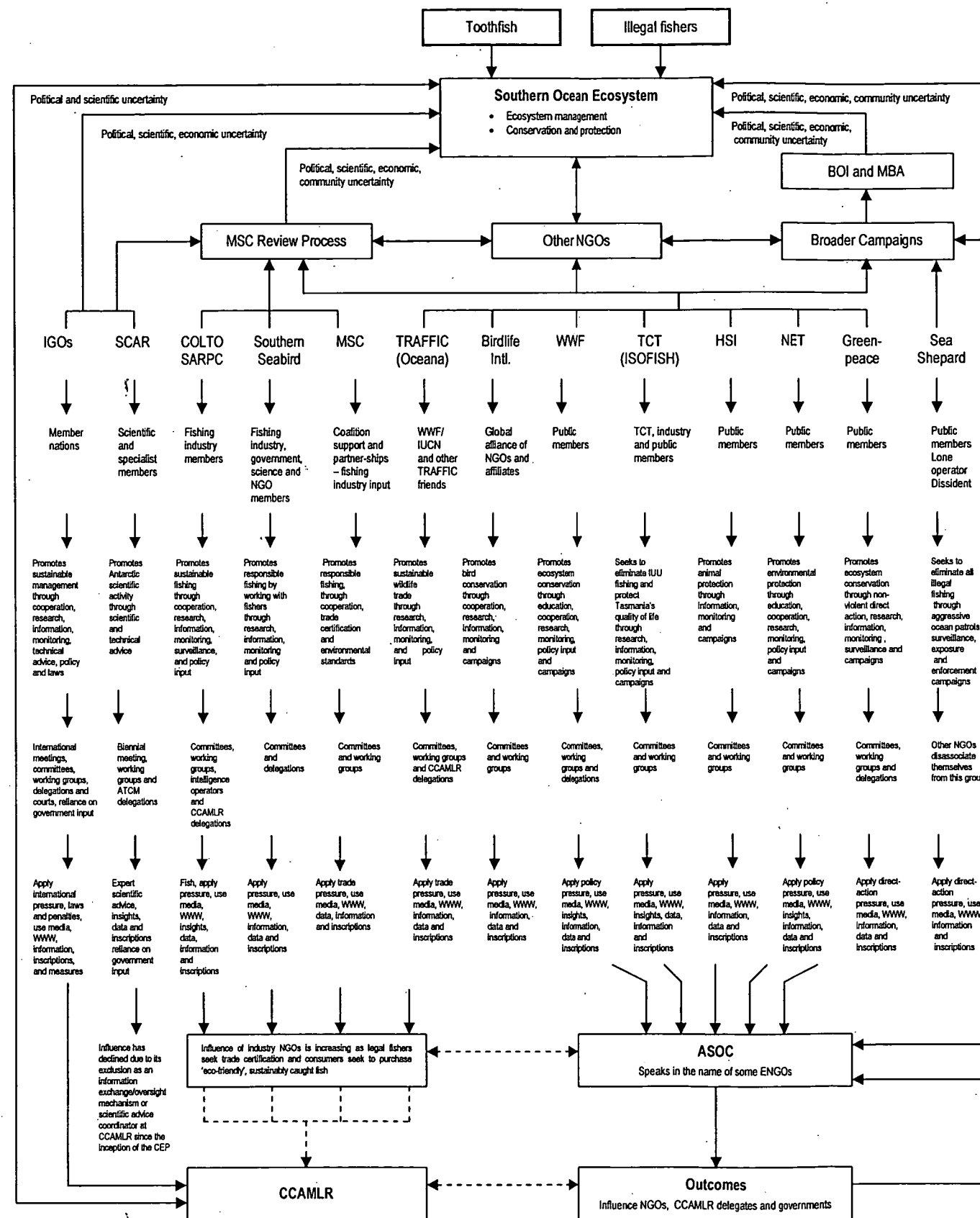


Figure 2.11: Sub-network D at the macro-scale – IGO and NGO alliances

Acronym Key

ACAP	Agreement for the Conservation of Albatrosses and Petrels
ASOC	Antarctic and Southern Ocean Coalition
ATCM	Antarctic Treaty Consultative Meeting
Birdlife Inter.	Birdlife International
BOI	Blue Ocean Institute
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CCSBT	Convention for the Conservation of Southern Bluefin Tuna Commission
CEP	Committee for Environmental Protection
CITES	Convention on International Trade in Endangered Species of Wild Fauna
CMS	Convention on Migratory Species of Wild Animals
COLTO	Coalition of Legal Toothfish Operators
CPPS	Commission on the South Pacific
CTE	Committee on Trade and Environment
ENGO	Environmental Non-governmental Organisation
FAO	Food and Agriculture Organisation of the United Nations
FFA	Forum Fisheries Agency
GATT	General Agreement on Tariffs and Trade
HSI	Humane Society International
IATTC	Inter-American Tropical Tuna Commission
ICCAT	International Commission for the Conservation of Atlantic Tunas
ICJ	United Nations International Court of Justice
IGO	International Government Organisation
IMO	International Maritime Organisation
IOC	Intergovernmental Oceanographic Commission
ISOFISH	International Southern Oceans Longline Fisheries Information Clearing House
ITLOS	International Tribunal for the Law of the Sea of the United Nations
IUCN	International Union for the Conservation of Nature
IWC	International Whaling Commission
MBA	Monterey Bay Aquarium
MCS Network	International Network for the Cooperation and Coordination of Fisheries
MSC	Related Monitoring, Control and Surveillance
NAFO	Marine Stewardship Council
NEAFC	Northwest Atlantic Fisheries Organisation
NET	North East Atlantic Fisheries Commission
NGO	National Environmental Trust
OECD	Non-governmental Organisation
SARPC	Organisation for Economic Cooperation and Development
SCAR	Syndicat des Armements Réunionnais de Palangriers-Congélateurs
SCOR	Scientific Committee for Antarctic Research
SPC	Scientific Committee on Oceanic Research
TCT	Secretariat of the Pacific Community
TRAFFIC	Tasmanian Conservation Trust
UK	Trade Records Analysis of Flora and Fauna in International Commerce
UN	United Kingdom
UNEP	United Nations
UNICPOLOS	United Nations Environment Program
	United Nations Open-Ended Informal Consultative Process on Oceans and the Law of the Sea
USA	United States of America
WTO	World Trade Organisation
WWF	World Wildlife Fund



Acronym Key

ASOC	Antarctic and Southern Ocean Coalition
ATCM	Antarctic Treaty Consultative Meeting
Birdlife Inter.	Birdlife International
BOI	Blue Ocean Institute
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CEP	Committee for Environmental Protection
COLTO	Coalition of Legal Toothfish Operators
ENGO	Environmental Non-governmental Organisation
HSI	Humane Society International
IGO	International Government Organisation
ISOFISH	International Southern Oceans Longline Fisheries Information Clearing House
IUCN	International Union for the Conservation of Nature
MBA	Monterey Bay Aquarium
MSC	Marine Stewardship Council
NET	National Environmental Trust
NGO	Non-governmental Organisation
SARPC	Syndicat des Armements Réunionnais de Palangriers-Congélateurs
SCAR	Scientific Committee for Antarctic Research
TCT	Tasmanian Conservation Trust
TRAFFIC	Trade Records Analysis of Flora and Fauna in International Commerce
WWF	World Wildlife Fund
WWW	World Wide Web

Figure 2.12: Sub-network E at the micro-scale – IGO and NGO alliances

2.5.3 Patagonian toothfish and fishers

The Patagonian toothfish exercises legitimacy and power because it has been reconstructed from a wild species that was undiscovered and little harvested by humans to a scaled fish resource that is highly prized by humans. It could be argued that the collective fish stock could mobilise the most power of all the actor-networks because it could choose to become extinct and diminish the actor-network to a new level. But perhaps adding to the confusion, Patagonian toothfish stocks are also dissident because when they not allow scientists to accurately predict their numbers. As a result, the fishery resource embodies scientific uncertainty by remaining elusive, migratory, transitory or straddling stocks. In addition, Patagonian toothfish stocks are also only ever partially enrolled in this actor-network because individually, the fish do not *choose* to become hooked onto longlines or caught in trawl nets and are caught regardless of whether its numbers are being ecologically threatened. Although Patagonian toothfish stocks are central to this actor-network, their position can be cast into doubt.

Fishers have also transformed their power relations over the last 20 years. Illegal fishers, and the governments which support them, have become powerful because they have impacted upon Patagonian toothfish stocks, and have gained significant financial returns from their contested activities by mobilising material actor-networks in the form of new advances in technology made either to catch fish or to evade surveillance and enforcement efforts, by mobilising human actor-networks who have increasingly sought to consume fish products. However, these actor-networks have failed to mobilise significant political or social power in some arenas. Conversely, licensed fishers (many of whom have conducted illegal fishing activities in the past) have increased their political and social power through their engagement and associations with CCAMLR members, government authorities, scientists, researchers and IGO and NGO representatives in their efforts to seek new solutions to manage and conserve this species in a sustainable manner. However, these actor-networks may have lost economic power due to illegal fishers' continued targeting of the stocks. Therefore, the power held by licensed and illegal fishers in the actor-network continues to be mobile and it is contested as their influence changes depending on the associations they mobilise within the actor-network.

2.5.4 Traders and consumers

ANT can be used to understand the market economy. For Callon (1997) the marketplace is an institution that controls the relations of humans and nonhumans. It is a constructed collective identity that requires the existence of a qualified product, a clearly constituted supply and demand, and organisation of transactions that allow for the equilibrium price to be established. For example, researchers are able to construct market transactions (for example: transform things into commodities) by framing transactions into buyers, producer-traders and commodities. This is advanced by cutting the ties between

commodities (such as goods which are inert, passive and classified as nonhuman) and humans (such as harvesters, producers, traders and consumers). Because commodities become decontextualised, dissociated and detached, humans are subsequently able to make complicated decisions and speak on behalf of commoditised actors and networks (see Marsden 2000). Framing allows the market to exist because distinct agents and goods are mobilised into the actor-network despite their independence to one another. For example, for the Patagonian toothfish to transform itself from a marine living creature to a resource and then to a commodity; it must disentangle itself from its natural ecosystem and move (or transform) from the ocean to the harvester-producer and then on to the producer-seller and customer-buyer. Conversely, if the fish remains entangled with the marine ecosystem, the one who harvests, produces, sells or receives it cannot escape from the web of marine relations and the framing is incomplete.

Vandenberghe (2002: 58) also argues that market societies can be based on self-interest where traditional forms of life are destroyed by the “planned imposition of the market by the state on the life-world.” Here, calculating human actors generally have divergent interests, pursue their own interests and engage in decentralised decision-making and transactions where conflicts are resolved in transactions that establish an equivalence measured by prices (see Callon 1997; Guesnerie 1996).⁷² They are able to relegate certain productive, trade and consumptive spaces over others, and they empower certain actors while marginalising others (Marsden 2000). This self-interest presupposes *possessive individualism* which re-centres society around the individual and his or her property. However, for agents to calculate their decisions, they must be entangled in a web of market relations and connections. For Vandenberghe (2002: 59), the self-interested market society has led to an “overindividualised” society where an individual’s actions and activities are coordinated through the market rather than through communication, and relations of personal dependence between humans are replaced in market societies by material relations between nonhumans and the “commodity fetish.”

ANT enables researchers to extend further than in traditional socio-economics or food supply analyses because it is able to investigate all actors influential in market actor-networks.⁷³ For Lockie (2002: 289), ANT provides a promising approach to consider

⁷² A market “opposes buyers and sellers, and the prices which resolve this conflict are the input but also, in a sense, the outcome of the agents’ economic calculation” (Guesnerie 1996: 8 in Callon 1997: 3).

⁷³ ANT has parallels with economic theory that traditionally describes the circulation of goods and the allocation of resources among human agents. Marsden (2000: 28) warns that ANT alone is not sufficient to analyse food economies and recommends that researchers look to food governance for guidance to understand “food as a *natural, social and political* construction.” Fine (2004: 337) also criticises ANT scholars for considering each market as being unique, and capitalism as no longer being presumed to exist because it is an “illusionary invention of political economists.” For him, ANT fails to acknowledge the body of literature on consumption and food that already exists in the social sciences and he recommends that researchers critically and constructively examine how others understand the relationship between nature and society. However, these issues are not contested by Lockie (2002) who considers that although ANT descriptions may not be able adequately to research production-consumption issues, they do provide a means to analyse the multiple ways in which humans are mobilised within these actor-networks.

the “multiple ways in which people are mobilised as consumers within production-consumption networks” and may act at a distance. Here, markets are the result of operations of disentanglement, framing, internalisation and externalisation (see Callon 2002; Fox 1999; Goodman 1999; Holm 2001; Marsden 2000).⁷⁴ In addition, ANT can show that a *centre of calculation* has no power unless actors can problematise something in ways other actors will accept, and can manage to enrol and mobilise other allies (Callon 1986; Dean 1999). However, *centres of calculation* have no power in themselves because power is an effect of the association of allies acting in concert. Therefore, macro-social actor-networks come into existence through local practices and force-relations (Fox 1999: 13) although their influence may be substantial, indirect or at a distance.

This investigation identifies various actors in the market actor-network construction and suggests some mechanisms through which wider actor-networks and *centres of calculation* arise. Market actor-networks are identified by calculating those who relinquish themselves once the transaction has been concluded. Although complete disentanglement is impossible, the process of market problematisation in the case of the declining stocks of the Patagonian toothfish is taken seriously. Here, the role of nonhuman and inhuman actor-networks (such as fish, money, equipment, devices, trade instruments, market infrastructure and inscriptions) in the performance of a constructed collective identity is important to economic functioning and the capacity of actor-networks to act in accordance with their head-actor-network (see Callon 1986).⁷⁵

However, using ANT to analyse trade in Patagonian toothfish products is challenging because generalised symmetry is potentially compromised when entities become delimited and their roles perfectly defined (see Goodman 2001). For example, market agents are characterised by very specific and highly demanding competencies; they are calculating, know and pursue their own interests, and take informed decisions. In addition, describing the market actor-network construction is difficult because producers and traders can operate both legally and illegally, are highly mobile, and generally seek to remain hidden from those not purchasing their products. Therefore, they comprise a leaky actor-network of disparate actors who act trans-nationally for personal gain. They also often act in dissident ways and, here, no-one speaks on behalf of the other actors or networks, no black box is formed and the actor-network fails to become stable. Paradoxically, although this construction is problematic, the marketplace is increasingly enrolling more diverse actors and institutions into the actor-network. Adding to these machinations is the lack of data, information and agreement between

⁷⁴ Fox (1999) extends this concept and explains that concepts like class or gross national product are not social actors but could also be the product of a *centre of calculation*.

⁷⁵ Given that nonhuman and inhuman actor-networks are intermeshed with the marketplace to create a proliferation of new identities, Callon (2002) proposes that new procedures and political institutions are required within the social sciences (rather than mainstream economics) to explain more precisely these complicated relationships.

human actors and otherwise identifying what constitutes market activities. A critical aspect of this investigation is my inability to describe this ANT construction despite its increasing importance in the *Patagonian Toothfish Network* due to the general lack of market data and the highly mobile characteristics of the actor-networks they form.

What can be said is that material investments are required to harvest the Patagonian toothfish and remove it from the Southern Ocean. Uncoordinated transactions between the licensed or illegal fishers and the other intermediaries engaged in interpersonal relationships are then needed to harvest, process and distribute Patagonian toothfish products. Fishers also offload their catches using port facilities, determine a price for their catch, and commence the process of commodifying the (now) fish merchandise. Processing plants and warehouse are needed to transform the fish into consumer items. Fish producers then take their packed products, and corresponding catch and market information, to the fish sellers (and CCAMLR as required). Sellers then classify the fish products and enter the data into various computers and inscriptions and compile sellers' catalogues detailing the items for sale and their mark-up price. These inscriptions are handed out to potential buyers at various fish markets. Buyers use money to purchase the fish products and relocate them to sales rooms and shops, along with the necessary inscriptions. Prices for the fish products are re-calculated, entered into computers and onto sales information inscriptions. Finally, consumers purchase fish products, relate them into commercial or domestic environments and this fish species is transformed into human foodstuffs. According to Callon (1997: 7), all of these different elements and devices create a space of *calculability* and contribute to "the framing of transactions by allowing for the rejection of networks of relations, and thus by constructing an arena in which each entity was disconnected from the others."

Therefore, the Patagonian toothfish market structure mobilises actor-networks and creates a space of *calculability* through techniques of fish processing and classification; the relative qualification of fish batches and their products on catch documentation and sales data inscriptions; price setting; bidding structures and the display of transactions on electronic boards, computers and other inscriptions; transfer of money; and knowledge of the international and national fish markets all made the transactions calculable. The crucial point here is not the intrinsic competencies of any human actor, but the mobilisation of nonhuman and inhuman actors which give his or her actions a shape, power and effect.

2.5.5 The researcher

As *the researcher*, I have become authorised to speak on behalf of the other actors and networks when translating information to other actors in the actor-network (such as seeking clarification on the status of fishing vessels in the Southern Ocean and passing this information onto CCAMLR or reviewing the accuracy of information on the Patagonian toothfish for various actor-networks) and as a narrator through the

inscriptions contained within this dissertation. My capacity to evoke a certain degree of convergence in the actor-network is illustrated in sub-network E (Figure 2.13). This dissertation is an *immutable mobile* because it is mobile, flat and two-dimensional, can scale inscription objects differently, and can be reproduced and distributed easily (see Latour 1987; 1990; Murdoch 1997a Tatnall & Gilding 1999). For example, documentary research, semi-structured questionnaire interviews and participant observations have been transported out of their original spatial settings to the *headquarters* of this investigation, my office and the technology contained within this space. In this sense, the research process has produced a black box because I have become the ultimate head-actor for the 10 key actor-networks (see Figure 2.3). During the research process, I held neither an anthropogenic or ecocentric position nor allowed hybrid politics to serve subjectively the interests of one or other actor in the socio-natural-material actor-network. Therefore, generalised agnosticism and impartiality between actor-networks and generalised symmetry and free association as outlined by Callon (1986), have all been established in an emancipatory way because I investigated the actors in this actor-network free from traditional research constraints.

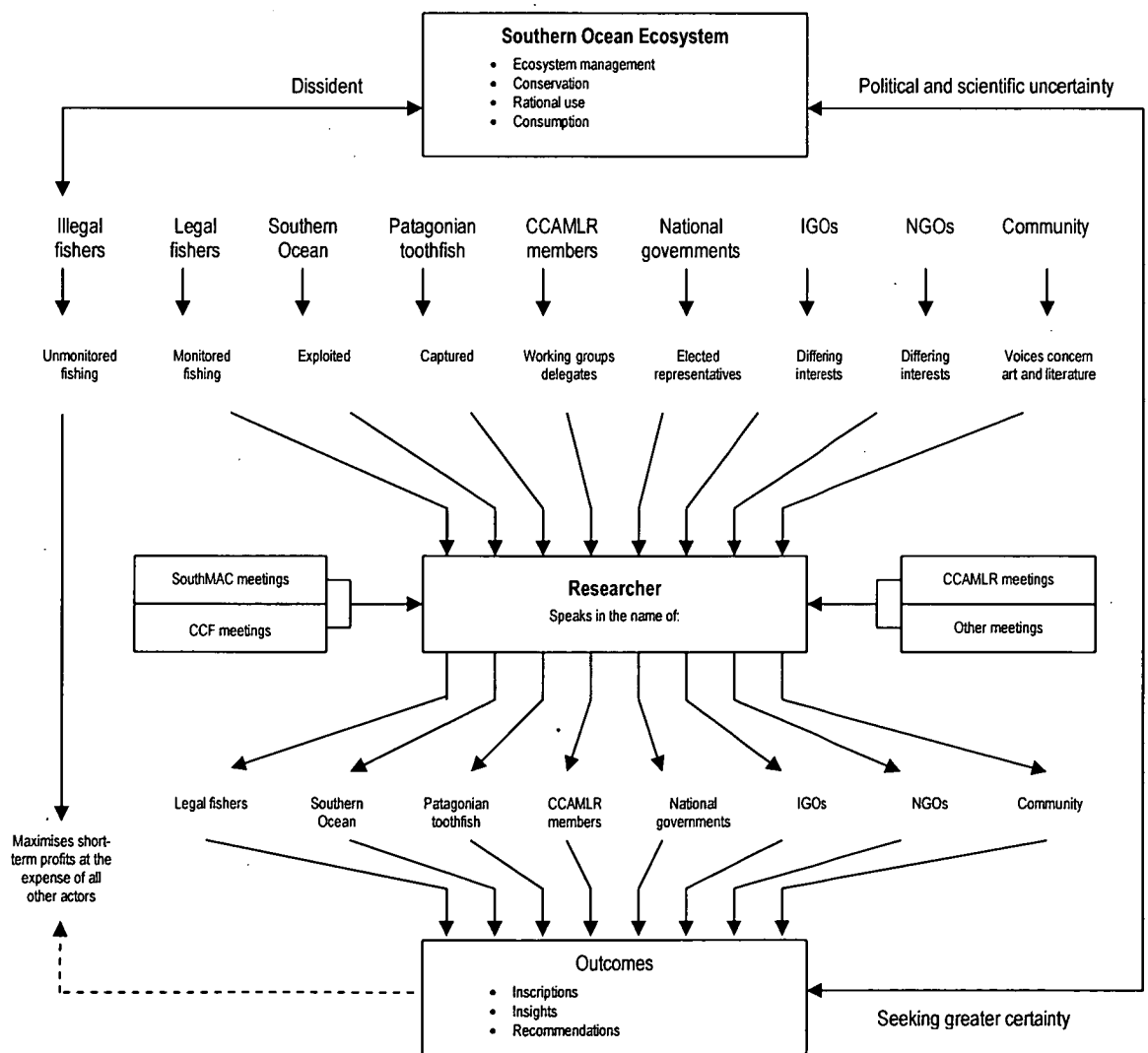


Figure 2.13: Sub-network E – I speak on behalf of the other key actor-networks

2.6 Summing up

Actor-networks move towards convergence or divergence, and stability within an actor-network is determined by an actor-network's ability to enrol other actors and networks regardless of their heterogeneity (Callon 1986; 1997; Holm 2001; Murdoch 1997a, b; Stadler 1997a, b). However, not all actor-networks successfully optimise the circulation of intermediary actors. When this occurs, the translation process is denied and the stability of the actor-network compromised. For example, in the *Patagonian Toothfish Network* the Patagonian toothfish, fishers, IGOs, NGOs, consumers and technology can go *their own ways*. In doing so, they betray the roles allocated to them by CCAMLR and its members. For example, the fish defy accountability, behave without certainty and may or may not be caught on fishing gear. Illegal fishers challenge moral and legal norms by disregarding conservation measures and legislative requirements set by CCAMLR members and national governments. IGOs continue to differ in their objectives, NGOs remain in awkward juxtapositions over aims and campaign strategies, and consumers choose to become users and purchase Patagonian toothfish products depending upon, or regardless of, its legal or illegal status. Inhuman actor-networks are also important. For example, fishing, surveillance or media communication technologies may fail because of logistical, manufacturing or user error. If these examples are taken into account, the circulation of various intermediaries within the actor-network becomes increasingly difficult because the alignment of actors becomes weaker. When this occurs, the black box loses some of its integrity the actor-network is compromised.

Because the Patagonian toothfish enrolls fishers and various fishing procedures and technologies into the *Patagonian Toothfish Network*, it is unable to regulate the numbers being caught and its survival is cast into doubt. The proposition that illegal fishers desire to see long-term sustainability of the stock is also contested. However, this argument highlights that natural, social and material phenomena are reorganised in the same way in the actor-network because fish in the natural ecosystem connect other actors into an equally socially constructed actor-network. The actor-network's power increases as it enrolls other actors. For example, fishery managers are dependent upon the fish and fishers if they are to *manage* the resources, and they enrol intermediary actor-networks (such as technology and inscriptions) to transform power and meet objectives at a distance. NGO representatives are also dependent upon the fish and fishers if they are to have something to protect, and they gain power by extending their associations using intermediary actors-networks (such as Internet and media services). Traders and consumers are also dependant upon the fish, fishers and the marketplace (including trading technologies, inscriptions and money) and are enrolled into the actor-network by their desire to profit from, or eat, fish products. Finally, I become more powerful through the connections I make with the actor-networks, and speak through the *immutable mobile* of this text to describe how the actor-networks influence one another in an environment of uncertainty.

Chapter 3

The Southern Ocean Fisheries

3.1 Introduction

The *Patagonian Toothfish Network* is extensive. In this study, I progressively describe a number of sub-networks to open up possibilities for multiple associations and connections between the Patagonian toothfish and other actor-networks at the global, regional, national and local levels. This chapter describes actors in a sub-network that comprise the Southern Ocean, which forms one large marine ecosystem (LME) and contains marine living and non-living resources within its waters. Understanding this sub-network provides the groundwork for the subsequent discussion on how Patagonian toothfish resources are collectively managed as one component of the ecosystem by state actor-networks at the international level. I explore what is to be governed and those who govern in terms of the means and instruments by which authority is constituted and rule accomplished. As such, nonhuman actor-networks embodied by the Southern Ocean ecosystem and Antarctic marine living resources are what human actor-networks seek to manage and conserve using an international framework comprising *technologies of agency* (that seek to enhance and improve participation, agreement and action) and *technologies of performance* (that seek to make these capabilities calculable so they may be optimised). This is achieved by state actor-networks mobilising various inhuman actor-networks (such as *technologies of communication* that include negotiations, the Convention on the Conservation of Antarctic Marine Living Resources and other international regimes, agreements, measures and fora; and national laws, policies and procedures) to align and discipline various actor-networks and create OPPs in an effort to stabilise the *Patagonian Toothfish Network* (see Dean 1999; Holm 2001; Latour 1987; 1998a; Law 1986). These technologies act at a distance to manage and conserve remote Patagonian toothfish fisheries by regulating States and fishers who seek to harvest the fish stocks.

First, I outline the conflicts and challenges for fisheries management generally, and specific tensions that emerge between actor-networks involved with the Patagonian toothfish. I then describe the Southern Ocean and its capacity to influence other actor-networks and the Antarctic marine living resources that have been discovered and harvested in its waters. In this context, Figure 3.1 illustrates that the Southern Ocean seeks to hold (stabilise) the Patagonian toothfish in the ecosystem by mobilising natural forces and cutting or weakening its links with those who might seek to remove (transform) it from the environment. This problematisation includes cutting the links between the fish and human actors that seek to exploit the fish stocks (see Callon 1986 in Section 2.4.3).

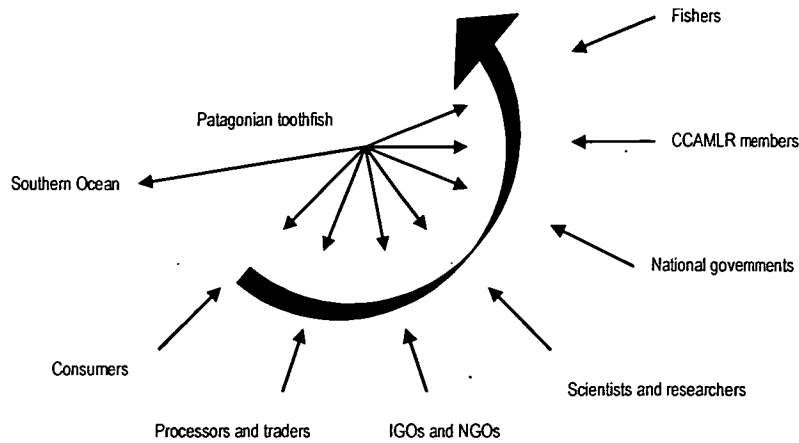


Figure 3.1: *Interessement* on the in-between where the Southern Ocean interests the Patagonian toothfish

State actor-networks including international bodies and national governments, and the historical and contemporary theoretical developments they have constituted to manage and conserve Antarctic marine living resources and the Patagonian toothfish, are then introduced to explain how state actor-networks seek to govern collectively other actors (see also Law 1999b; Murdoch 2000). For example, the development of international arrangements that associate governments *contract* them into management obligations and make their actions calculable and comparable so that governance can be implemented across the various jurisdictions of the Southern Ocean.

The sovereign power of state actor-networks is important in this discussion because States are the moving foundation of force relations internationally despite the constant inequality and instability of their power (see Foucault 1984). Historically, sovereign States achieved their power in the seventeenth century when the Treaty of Westphalia of 1648 divided and formally recognised a series of national boundaries (Cole 2003). By the early twentieth century, States gained an unparalleled dominance in the conduct of international politics through their common global structures and their mutual acknowledged rights, powers and territory divisions. As a result, they are generally regarded as the primary actor-networks in world politics because they are autonomous and maintain political power within their own national spheres of influence (in a self-interested manner) by enforcing national laws, providing national security, determining the scope and mode of formal international communications and diplomatic discourse and the terms and conditions of trade and monetary policy (see Bull 1977; Mansbach *et al.* 1976; Taylor 1984; Wapner 2000).

In this regard, sovereignty traditionally conferred on States three specific spheres of legitimacy and power with respect to exploiting marine resources: the ability to control national maritime waters and natural resources therein; the right to exploit natural resources; and the authority to develop and enforce environmental regulations,

standards and policies, and priorities in accordance with specific national interests and values (see Kaimieniecki & Scully Granzeier 1998; Litfin 1988). However, contemporary environmental threats, ranging from ozone depletion and global warming to land degradation and over-exploitation of ocean resources, transcend State boundaries and encroach upon State sovereignty. Increasingly, “States are being asked to curtail or halt their development and environmental policies to harmonise with those of their neighbours and, in some instances, the entire international community” (Wapner 1998: 275). These issues are particularly relevant to those seeking to govern the Southern Ocean ecosystem and Antarctic marine living resources because both transcend coastal State territories in the Southern Hemisphere and encroach upon national sovereignty when States are pressured to take action in actor-networks that extend beyond their boundaries for the common good.

3.2 Conflicts and challenges for fisheries management

In the twentieth century, salt fish technology was replaced by rapid transport, factory and freezing vessels to process and freeze fish at-sea, and frozen fish markets and packaged fish products (Apostle *et al.* 1998; Kowaleski 2000; Zugarramurdi *et al.* 1999). These developments allowed for the expansion of fish trade from distant water fisheries, including the Southern Ocean fisheries, because they reduced storage uncertainties and wide price fluctuations associated with gluts (Vogler 1992). Until this period most fisheries remained largely unregulated because it was thought that market forces would protect fish stocks (Hanich 1999; Lewis 1990). This thinking was questioned in the 1950s, and significant developments in fisheries management then occurred in response to increasing pressure upon finite marine resources. Concepts such as ecologically sustainable development (ESD)⁷⁶ and the precautionary principle, and increased understandings about scientific uncertainty and the complexity of ecosystems, squeezed the debate through new socially constructed OPPs and led to ecosystem approaches to fisheries management in place of single stock management.⁷⁷ These developments were accompanied by new market forces advocating global imperatives and economic efficiency.

Until the 1970s, fish stocks were abundant; fishers earned profits and fishing capacity increased. Fisheries management was largely based upon the concept of maximum sustainable yield (MSY) (Lewis 1990; Sahrhage & Lundbeck 1992) which allows for “the greatest harvest that can be taken from a self-regenerating stock of animals year

⁷⁶ ESD is a normative practice mobilised at various social scales to respond to the effects of globalisation, with the aim of protecting biological diversity, promoting precaution, maintaining equity, alleviating poverty, and working within technological and social organisational limits (see Bruntland 1987; Buttel 2003; Gibbs & Jonas 2000; Linnros & Hallin 2001).

⁷⁷ In his ANT focused research on fundamental institutional change in Norwegian fisheries during the 1980s and 1990s, Holm (2001) refers to the social construction of fisheries resource management as a theoretical invisible revolution because fundamental changes to society, culture, politics, ecosystems and fisheries have been *taken-for-granted*.

after year while still maintaining the average size of the stock” (Birnie & Boyle 1992: 437).⁷⁸ However, these largely unregulated fish stocks became over-exploited and problems caused by the open access to the fisheries increased. These problems were caused by the fishers’ traditional open access to sea fisheries as a common property resource, owned by no-one and shared by all.⁷⁹ Garrett Hardin then introduced the *Tragedy of the Commons* in 1968 and argued that the tragedy arose due to the desire of individuals to maximise their potential gain from the common resource (Hardin 1968: 1243-48).⁸⁰ For example, the conscience of individuals would not intervene to prevent over-exploitation of common resources because fishers would peruse their own interests (Mansfield 2004). Although any loss caused by over-exploitation *might* be shared amongst all users, it is more likely that if some fishers limited their harvest to a sustainable level this *saving* would benefit other more aggressive fishers. Hardin (1968: 1247) argued that the permanent tension between individual and collective interests in the use of open access resources dictated that authoritarian centralised solutions were required to manage the fisheries based on “mutual coercion, mutually agreed upon.” For him, if resources are owned through property rights, individuals act in their own interests to manage sustainably the resources they control. Accordingly, with ownership, resources can be managed through external authority and regulation (Colebatch & Larmour 1993; Mansfield 2004). However, Holm (1999: 7) argues that the *Tragedy of the Commons* “represents an explicit social theory contained in the presently dominant fisheries resource management paradigm ... tragedy will not necessarily result if the State does not take over the management of, or install private property rights over, resources.” He draws on Kasdan (1993) and Maurstad (1992) to highlight that tragedy did not occur until the solutions to counteract it were introduced and is real because it has been taken to be real. Therefore, from ANT perspective, such fisheries management is inextricably connected to both natural and social perspectives.

Since the 1970s a new naturally focused ecological paradigm resulted from dramatic changes in the understanding of and approach to conservation of living resources, including the development of the ecosystem management approach (Talbot 1996).⁸¹ In response to fish stocks no longer being considered inexhaustible, the International Union for the Conservation of Nature (IUCN) General Assembly adopted a number of Principles in 1976 replacing MSY as a basis for managing marine resources. These

⁷⁸ The notion of MSY was refined at the 1955 *Rome Technical Conference* that preceded LOSC 1 (Birnie & Boyle 1992). It was assumed that exploited stock could maintain a *fished equilibrium* whilst producing a surplus necessary to return to its *unexploited equilibrium*. The surplus could be harvested.

⁷⁹ As a common resource pool, fish are vulnerable to over-exploitation because they are mobile, difficult to bound, and their extraction by one fisher affects what is available to others (Apostle *et al.* 1998).

⁸⁰ Similar to open access to fish resources; in Hardin’s *Tragedy of the Commons*, the archetypical English medieval commons is over-grazed as herders try to maximise the number of sheep grazed on it (*The Ecologist* 1993). The commons are not anarchic; but are closely governed, “by informally defined rules, by communities who depend on them” and on particular social and cultural norms (Paterson 2000: 63).

⁸¹ Holm (2001: 94) points out that nature is a social construction because “true knowledge of nature is not available”, and given that nature is open to different human interpretations, “which interpretation will be dominant is a question of power.”

Principles require that ecosystems be maintained to realise both consumptive and non-consumptive values on a continuing basis and to ensure the maintenance of both present and future options (Birnie & Boyle 1992). Science-based fisheries management was adopted based on quantifying human impacts on fish stocks, and social power was allocated to protecting fish resources through the extension of State jurisdiction under LOSC (Apostle *et al.* 1998). This approach transformed fisheries management and constituted a new nature and a new society where scientists determined how fish resources could be rationally utilised. Not only were the fish naturally constructed in the ecosystem, the fish resources themselves became socially constructed when the structure and dynamics of fish stocks were represented in the places where management decisions were taken, largely by the scientific community (see Holm: 2001). As scientists became increasingly powerful actors in global fisheries management actor-networks, they proposed *optimal fishing* where economic interests could be balanced with biological, economic and social factors. *Optimal yield* was set lower than the MSY because fishery managers recognised that MSY failed to take into account socio-economic concerns and the ecological relationships between species and their habitat (Birnie & Boyle 1992). Developments in customary international law resulted in States losing a degree of their traditional exclusive sovereign power because they advocated that the oceans were the responsibility of the global community and, as such, all States shared the obligation to ensure the continued survival of the marine ecosystems and work with each other to protect oceans under multiple jurisdictions (see Belsky 1986).

However, LOSC lacked global authority to manage high seas fisheries, nor did it include management of ecosystems or trans-boundary fish stocks, and the mismatch between sovereign State control and the global nature of environmental change continued to act as a permissive cause of global environmental change on fish stocks (Paterson 2000). Correspondingly, States retained the power to establish rules for their own nationals inside and outside national territories, and they were free to promulgate whatever rules they wished for marine resources within their sovereign waters (Belsky 1986). Internationally, no supreme authority existed and sovereign States dealt with each other, with regard to their sovereignty, on a basis of equality. This conceptualisation informs the United Nation's principle of *sovereignty equality* where sovereignty functions as a gate between domestic politics and international relations (Litfin 1988). Consequently, the Tragedy of the Commons continued in the over-exploitation of high seas fish stocks. Therefore, LOSC and international law were unable to exert power effectively on other actor-networks and constituted a reversible and leaky actor-network that could not be black-boxed or *punctuated* into a single node to connect successfully with national sub-networks (see Callon 1987; Latour 1987).

Given that environmental pressures associated with the over-exploitation of fish stocks transcend State boundaries, national governments came under mounting pressure in the 1990s to manage their resources in harmony with neighbouring States and in

accordance to international norms (see Chasek 2000; Kaimieniecki & Scully Granzeier 1998; Wapner 1998). By mid-1993, Canada had also declared a *Cod Moratorium* on commercial cod fishing off its Atlantic coast, Iceland had cut back domestic fishing by 50 per cent and Atlantic haddock, flounder and cod fisheries in waters off the United States had virtually collapsed (see Earth Summit +5 1997; Kurlansky 1999). This *modern crisis* was attributed to highly competitive global markets, the diminishing role of State governance in fisheries (particularly on the high seas), and the growing legitimacy of market mechanisms (Apostle *et al.* 1998; Hanich 1999). At the same time, the number of fishing vessels increased and larger-scale capture technology continued to improve. A *cycle of over-exploitation* of fish stocks ensued where the stocks in one fishery were depleted below economic levels and fishers abandoned the fishery and moved to new fishing grounds (Talbot 1996).⁸²

Over the past decade, economic efficiencies have resulted in fishing operators from more developed States increasingly relocating to less developed States, such as those from South-east Asia, where wages are lower and government regulations are often absent. Their operations are technically innovative, highly competitive and oriented to a global market (Beccatini 1990), and not constrained by space, time and currency (Agnew & Corbridge 1995).⁸³ These changes have been accompanied by advances in electronic communication, information and transport technologies that connect distant actor-networks (Brahm 2005) and have contributed to the development of the international Patagonian toothfish fishery (Fallon & Stratford 2003a).⁸⁴ Most notably, fisheries management has become highly political and especially about the articulation and coordination of conflicting interests and demands between stakeholders as described by Apostle *et al.* (1998: 121) who state that:

The ineffectiveness and outright failures of management ... in ... the 1980s and 1990s triggered an international debate on the proper role of government, science and user groups in the management of marine resources. There is now widespread concern that national jurisdiction and centralised decision-making based on biological data and bioeconomic models may be neither capable nor sufficient for the conservation ... of marine resources.

It is against this background of politics, conflicting interests and demands that human actor-networks seek to manage and conserve Patagonian toothfish stocks. However,

⁸² Such a *cycle of over-exploitation* is characterised by the discovery of a new fishery (or new technology or methodology); a fishery developing rapidly based on market demand; and little regulation, overcapitalisation, and fishing rapidly exceeding the potential for the stocks to sustain it (Talbot 1996).

⁸³ The globalisation of the political economy is based on the internationalisation of production and finance, new divisions of labour, migration from poorer to richer States and the internationalisation of State activities (Agnew & Corbridge 1995). Since the 1960s, advances in communication, informational technologies, and modern air and ship transport, have accompanied these changes and effectively tied ideas, products and people together in widely separated places.

⁸⁴ For Brahm (2005), it *seems* that globalisation and technological innovations allow for greater production/information availability and the disadvantaged to participate more equally in democracies. However, access remains uneven, may negatively impact upon social capital, and can stifle debate by making it easy to customise information and avoid opposing views.

migratory and trans-boundary Patagonian toothfish stocks are found in both coastal State waters located in the Southern Ocean and on the high seas outside the control of State laws and regulations. As a result, tension exists between coastal States in the Southern Ocean and other actor-networks about how to distribute these stocks equitably between those seeking to harvest the stocks and those wanting to manage the stocks sustainably to ensure that each fishery persists. In addition, and in pursuit of maximising fishing potential, many actor-networks afford little consideration to the interests of coastal States or the Patagonian toothfish and other marine species that may depend upon it for their survival.

Nonetheless, the Patagonian toothfish and Southern Ocean emerge, not only as biological and ecological entities, but also as more powerful entities when they are enrolled into the complex social/technical/symbolic/legal actor-network. For example, without the Southern Ocean, the Patagonian toothfish would have no ecosystem in which to reside. Correspondingly, fishers would be unable to access a non-existent Southern Ocean and harvest fish stocks. Importantly, the Patagonian toothfish would not confer either moral or legal status on the different types of fishing that target the fish stocks. In addition, scientists would be unable to study the physical, climatic and biological characteristics of the Southern Ocean or the dynamics of the toothfish, and fishery managers would have nothing to manage. Without these key actor-networks NGO campaigners would also have nothing to conserve and/or preserve or other actor-networks to influence, traders would have nothing to sell and consumers would re-direct their attention to other food sources. Therefore, tension exists between the Southern Ocean and those actor-networks who seek to exploit the Patagonian toothfish. Power is translated by the actors to other actors in the network in an effort to maintain their position in the actor-network. For example, the Southern Ocean translates power through physical, climatic and biological forces in an effort to *hold* this species in its waters and impede those who seek to access these waters and harvest fish. In addition, the Southern Ocean has the capacity to act in a dissident manner by changing ecological characteristics and impacting upon the abundance of Patagonian toothfish stocks, which in turn could reduce catch rates and the economic viability of the fishery.

CCAMLR members also form key actor-networks in the *Patagonian Toothfish Network* because in generating principles, practices, inscriptions and measures to manage and conserve the Patagonian toothfish, they are involved in negotiations, instrumentalities and mechanisms (see Dean 1999). In particular, CCAMLR meetings provide fora where members are able to articulate and aggregate their views internationally. They contribute to normative activities of the international political system where shared values and standards are established. In addition, these actor-networks represent their own interests independently but promote international socialisation and accept the prevailing values of the Convention on the Conservation of Antarctic Marine Living Resources, particularly when they accept rules in a consensus way (although providing

a means of enforcing such measures remains contested). CCAMLR members also communicate and share information, and have an opportunity to build capacity, strengthen national resolve and make changes for the common good. By mobilising intermediary actor-networks in their own *CCAMLR Sub-network*, they translate power and influence other governments, scientists, fishers and NGO groups. However, their ability to translate power can also be impeded because each management step is slow, restricted and characterised by significant constraints. Some constraints are financial such as the costs of monitoring and enforcement of laws. Others are conceptual, related more closely to restrictions in law and policy. For example, the adoption of electronic catch documents and the installation of satellite-tracking devices on board fishing vessels to monitor fishing activities have been criticised by some CCAMLR members on the grounds that they unacceptably interfere with their international sovereign rights on the high seas. CCAMLR members may also act in a dissident manner by promoting national interests and actively protecting their sovereign rights whilst disregarding CCAMLR principles and measures.

National governments, as CCAMLR members or independent States, also influence Southern Ocean affairs and the *Patagonian Toothfish Network*. In addition, the international scientific community plays a key role in Southern Ocean affairs and scientists mobilise power from inside the State or independently. For example, the Antarctic Treaty and Convention on the Conservation of Antarctic Marine Living Resources negotiations were heavily influenced by the activities and contributions of the Scientific Committee on Antarctic Research (SCAR). However, despite the influence of scientists, difficulties have arisen between political and scientific participants in CCAMLR that have resulted in tension over whether the opinions of scientists should be accepted by CCAMLR members as fact or whether CCAMLR “remains able to make its own independent judgments” (Rothwell 1998: 21).

Commercial fishers, whether they operate legitimately or illegally, may also pursue their interests in a hidden way through CCAMLR members or national governments by influencing the position that those parties take nationally or internationally. Alternatively, they may overtly take part in national CCAMLR delegations. Their influence has various consequences. For example, licensed fishers may provide substantial positive outcomes to the toothfish fishing industry by adopting sustainable fishing practices, providing surveillance in distant waters or conducting research into illegal fishing activities. Conversely, they may seek to advance their own interests and persuade their governments that supporting CCAMLR conservation measures is not in the national interest. At worst, they can challenge the moral and legal status on the different kinds of fishing if they choose to fish in a socially construed *criminal way* by acting in contravention to international or national laws and conservation measures.

Together, these actor-networks influence two models of political organisation pursuing economic interests in the Southern Ocean: those within and those outside State

territorial control (Bush 2002; Fallon & Stratford 2003a). Therefore, claiming territory is an important issue for those States asserting control over the toothfish resources. For example, explorers and commercial interests urged their governments to assert sovereignty in the Antarctic before and after the Antarctic Treaty System (ATS) was established as a means to secure rights to resource exploitation. Alternatively, the open access model similar to that proposed by Hardin in 1968 is exemplified by access to high seas resources. Typically, if access to high seas resources is to be restricted particular limits need to be imposed by the State of nationality. Consequently, territorial jurisdiction controls territory whereas national jurisdiction applies to open access. These issues are particularly relevant to the exploitation of the Patagonian toothfish.

According to Bush (2002), open access is attractive to States that, themselves or through their nationals, are able to exploit resources. The State retains maximum discretion and is not beholden to other States. Industry operators also often find open access regimes attractive because they promise greater freedom and scope for self-regulation. In this regard, the restrictions imposed on industry operators by some States may be less restrictive than those imposed by another and “individuals make purely economic decisions based on relative costs and benefits” (Mansfield 2004: 319). Under the open access system, industry operators dissatisfied with the restrictions of one State may rearrange their affairs outside the international regulatory structure and under the national jurisdiction of a less restrictive State (DeSombre 2005). In an extreme form this scenario can lead to the use of flags of convenience (FOCs).

3.3 The Southern Ocean

The Southern Ocean was named by Captain James Cook in the 1760s and its discovery by Europeans predated that of Antarctica. Located in the Southern Hemisphere, it is a hostile and remote marine environment that embodies a complex and natural *Southern Ocean Sub-network*. It is the fourth-largest of the world's five oceans (after the Pacific, Atlantic and Indian Oceans), constitutes from 11 to 15 per cent of the world's total ocean surface (Joyner 1995; Miller 1991; Sabourenkov & Appleyard 2005) and has a total area of approximately 25 million square kilometres (CIA 2001; Stonehouse 2002).⁸⁵

The Antarctic Convergence (or Antarctic Polar Front) surrounds the Southern Ocean at its northern boundary from 50°S to 60°S and it is a major oceanographic and biological

⁸⁵ This ocean is a large, annular, unbroken and dynamic water body that circles Antarctica and connects a series of semi-closed interconnected ecosystems to form one LME comprising the southern portions of the Pacific, Atlantic and Indian Oceans (AFMA 2005e; LME 2003; Scott 1994). Its northern boundary is more or less south of 45°S and the central land mass of the Antarctic continent forms its southern boundary (AAD 2002a Vidas 2000). South America, Africa and Australia intrude upon this ocean, and these land masses and a scattering of islands and other suboceanic features form focal points for local hydrographic effects. A narrowing between the Antarctic Peninsula and South America is the only significant feature to impede the Southern Ocean's major wind and current systems. These systems are circumpolar and there is a marked Coriolis effect due to the earth's rotation (Gyory *et al.* 2005).

boundary that effectively makes this ocean a closed ecosystem (AFMA 2005e; Scott 1994). This is a relatively narrow zone of water approximately 50 to 100 kilometres wide where cold, less saline, northward-flowing Antarctic water slides under the warmer, southward-flowing sub-Antarctic waters of the Atlantic, Indian and Pacific Oceans. The Kerguelén, Crozet, Prince Edward, Marion and Macquarie Islands lie in, or near, the Antarctic Convergence and are part of the Southern Ocean (Smith *et al.* 2005; Tomczak & Godfrey 2005). Many Patagonian toothfish fishing grounds are located in these areas. Importantly, there remains a common assumption that territorial boundaries in the Southern Ocean, such as the Antarctic Convergence, are natural (based on the biological assumption of oceanic circulation) rather than explicitly political boundaries. However, it is a socially constructed boundary that continues to be, “implemented and contested by institutions and political bodies” (Dodds 2000: 231). These tensions similarly impact upon the management and conservation of the toothfish.

The Southern Ocean has great variations in depth although the mean depth is close to 4,000 metres and it exceeds 8,000 meters in the South Sandwich Trench (Stonehouse 2002). The Antarctic continental shelf is also unusually deep and narrow with its edge lying at depths of 400 to 800 metres (the global mean is 133 metres) (CIA 2001). Other shelf areas surround the island groups. Along with banks and chasms, they promote upwelling of nutrients that provide food for marine species. Given the local concentration of biota (including the Patagonian toothfish) near these shallower and nutrient-rich features, they can be the focus of commercial harvesting operations. This ocean also consists of a system of deep basins separated by three large mid-oceanic ridges (CCAMLR 2002a). The Macquarie Ridge is found south of New Zealand and Tasmania; the Kerguelén–Gaussberg Ridge (hereafter the Kerguelén Plateau) extends south from the Kerguelén Islands; and the Scotia Ridge (or Scotia Arc) extends from the Southern Patagonian Shelf to the South Shetland Islands and the Antarctic Peninsula. Patagonian and Antarctic toothfish are located in each of these regions.

Two important circumpolar currents affect the upper layers in the Southern Ocean. The eastward-flowing Antarctic Circumpolar Current (West Wind Drift) connects the Pacific, Indian and Atlantic Oceans. It flows close to the Antarctic Convergence, is bounded by the sub-Antarctic and Polar Fronts and is the largest ocean current in the world at 21,000 kilometres in length (CIA 2001; CSIRO 2000; Gyory *et al.* 2005; Rintoul 2003). Near the Antarctic continent, the more discontinuous westward-moving East Wind Drift is broken into a series of clockwise gyres and local eddy systems close to the continental margin, such as the Weddell Sea and Ross Sea gyres (Miller 1991; Rintoul 2003). Together, these fronts mark large changes in temperature and salinity and act as natural boundaries for toothfish stocks or conveyers for transporting these species around the Southern Ocean.⁸⁶

⁸⁶ Thermohaline instability induces periodic nutrient upwelling, and these vertical differences influence the Southern Ocean’s biological productivity and the abundance of the toothfish.

The Southern Ocean also significantly affects world climates in three ways (CSIRO 2000). First, the Antarctic Circumpolar Current redistributes heat and other properties globally. This redistribution influences global temperature and rainfall patterns. Second, this ocean's intermediate and deep-sea currents distribute water and renew the world's other oceans with cooler Antarctic water.⁸⁷ Third, water exchanges gases such as oxygen and carbon dioxide with the atmosphere at the sea surface while being cooled. As this water sinks, it efficiently transfers heat, freshwater and absorbed gases from the atmosphere (including carbon released into the atmosphere by the burning of fossil fuels and deforestation) into the deep-sea.

It is in the Southern Ocean that the strongest average winds and largest waves anywhere on earth occur (CIA 2001; AAD 2002a). For example, the Circumpolar Current is driven by strong westerly winds with an "average wind speed between 40°S and 60°S [of] 15 to 24 knots with strongest winds typically between 45°S and 55°S" (Smith *et al.*: no page). These winds gather over the Southern Ocean and, given that there are few impediments to airflow and winds over the ocean's surface, high velocities generate very large ocean waves. Wave heights are often over five metres particularly between the latitudes of 45°S and 60°S in the Indian Ocean and parts of the Eastern Pacific.

In addition, Antarctica is surrounded by sea-ice for most of the year.⁸⁸ The southern two-thirds of the ocean's surface water freezes during winter to depths of three metres, forming a floating sea-ice belt 500 to 1,500 kilometres wide (see AFMA 2005e; Stonehouse 2002). Some is attached to the land (fast-ice) and the rest drifts with the wind and currents (pack-ice).⁸⁹ This cover contributes to the supercooling of Antarctic waters, and in these waters is located the Antarctic toothfish.⁹⁰

The extreme physical, climatic and biological conditions help to ensure the Patagonian toothfish is held in the *Southern Ocean Sub-network*, and it is a dangerous workplace

⁸⁷ Cooling of the Southern Ocean and formation of sea-ice during winter increase the water's density, and it sinks into the deep-sea to generate deep currents that redistribute cooler waters to other oceans.

⁸⁸ The permanent ice zone or high-latitude Antarctic zone is adjacent to the Antarctic continent and remains ice-covered for most of the year.

⁸⁹ Breaks are found in the sea-ice where leads (fissures in the ice) and polynyas (enclosed areas of unfrozen water surrounded by ice that recur annually in the same places) allow exchange of gases and provide access to the water surface for marine species (see Simon 1982). Polynyas contribute to regions of low biological productivity. However, concentrations of high productivity are associated with the presence of sea-ice, particularly at the ice edge. Combined with regions of upwelling or current-borne nutrient-bearing water, shallower sub-marine features, cycles of solar illumination and stable water conditions near the sea surface, sea-ice regulates phytoplankton production (El-Sayed 1978; Miller 1991).

⁹⁰ An ice-free zone, seasonal pack-ice zone, and permanent ice zone or high-latitude Antarctic zone, each with its own assemblage of species, can be distinguished in the Southern Ocean. The ice-free zone lies between the Antarctic Convergence and the northern limit of the pack-ice in winter. Many organisms – including the Antarctic toothfish – do not move north of the Antarctic Convergence, and its effects are relatively shallow and between about 300 and 500 metres (see Kock 1992). The intermediate seasonal pack-ice zone is ice-covered in winter and spring. This zone is the most biologically productive of the three, with the highest primary productivity of phytoplankton (Hempel 1987). It also has the highest commercial concentrations of Antarctic krill (*Euphausia superba*) and this is the dominant planktonic organism and staple food of many whales, seals, birds and fish.

for fishers, particularly with regard to dynamic and often hostile short-term climatic variations. Many other natural hazards weaken the links that fishers maintain in the actor-network, resulting in the safety of fishers and the success of their operations becoming more precarious. In this context, natural hazard might include large annual and inter-annual climatic variations, extreme cold, high winds and large waves, deep waters and ship icing. In addition, the large distances that fishers travel to access remote Patagonian toothfish fishing grounds also weaken their links in the actor-network and contribute to their vulnerability because they operate beyond the boundaries of national search and rescue activities. However, the behaviour of the Southern Ocean is uncertain and unpredictable and, therefore, this natural sub-network is less convergent and difficult to black-box. Consequently, full description is necessary to understand that each actor-network's endeavours to translate other actor-networks fluctuate without ever stabilising. Nonetheless, the Southern Ocean is a powerful actor-network because it forms connections between a large number of actor-networks that are able dynamically to break off and bind together.

3.4 Southern Ocean marine resources

Of the almost 20,000 species identified in the world's oceans, about 270 species inhabit the Southern Ocean waters (Kock & Shimadzu 1994; Mascoli 2004). The significant living resources located here are whales, seals, birds, fish, krill and squid, and their use (which is characterised by the progressive over-exploitation of seals, whales and finfish) goes back over two centuries (Agnew & Nicol 1996; Walton 1987) (Figure 3.2).

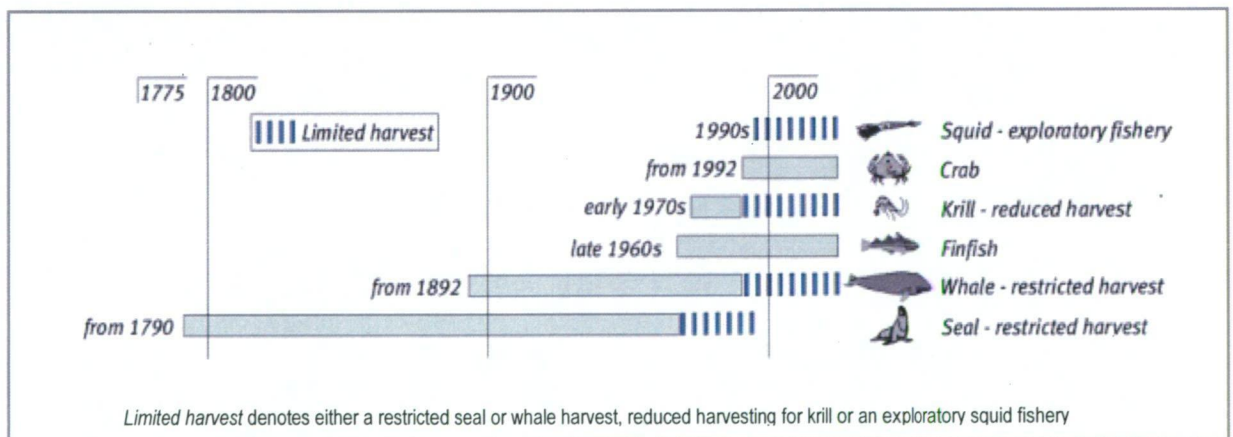


Figure 3.2: Exploitation of Southern Ocean marine resources (Source: Fallon & Stratford 2003b: no page)

When Captain James Cook crossed the Antarctic Circle and discovered South Georgia and the South Sandwich Islands between 1772 and 1775 (Kriwoken & Williamson 1993; Wikipedia 2005f) he reported fur seals in abundance (Stonehouse 2002). His ability to mobilise other actor-networks, including his successful navigation of the vessel *HMS Resolution* enabled him to become on 17 January 1773 one of the first people to cross the Antarctic Circle (Antarcticaonline.com 1998; Wikipedia 2005f). His

discovery marks the mutation of the natural *Southern Ocean Sub-network* with the beginnings of exploitation of marine species by hunters that effectively starts with sealing dating from 1786. After this, a major commercial fishing industry developed on many sub-Antarctic islands in about 1790 when hunters exploited Antarctic fur seals (*Arctocephalus gazelle* and *A. tropicalis*). Exploitation resulted in seal populations being reduced to low levels within decades.⁹¹

By the 1800/01 fishing season, more than 110,000 sealskins were taken on South Georgia alone (CCAMLR 2002a). Harvesting continued into the nineteenth century when hunters discovered seal stocks on the South Shetland Islands in 1819/20 (Agnew & Nicol 1996). By 1825, most populations of Antarctic and sub-Antarctic fur seals were on the verge of extinction and it was not until the 1930s and later that numbers began to increase due to additional krill availability and subsequent natural species recovery.⁹² Unregulated sealing generally stopped within the first two decades of the twentieth century although the last known sealing in the Antarctic was conducted by the former Soviet Union in 1986/87 (see Constable 2002; (McElroy 1984).

Southern right whales (*Eubalaena australis*) were initially hunted by fishers (Kock 1994). However, it was not until the twentieth century that whaling of all seven species of baleen whales (rorquals) and toothed whale (*Physeter macrocephalus*) began. By 1937/38, 45,000 whales had been harvested from Southern Ocean waters and the whale catch from 1904 to the 1980s is estimated at more than 1.5 million.⁹³ In response, the International Whaling Commission (IWC) was established in 1948 and adopted a *Whaling Moratorium* on commercial whaling in 1982 (Andresen 1999; McElroy 1984).⁹⁴ Some States including Japan continue to harvest Minke whales (*Balaenoptera acutorostrata*) on scientific grounds under a *scientific whaling* exemption to the moratorium (Stone 2002a; Stonehouse 2002).

During the 1960s fishers became interested in new commercial Southern Ocean resources (McElroy 1984). The mutated *Southern Ocean Sub-network* expanded to include other species that are being or have been harvested such as Antarctic krill, Marbled rockcod, Mackerel icefish (*Chamsocephalus gunnari*), Patagonian rockcod

⁹¹ British polar explorer and sealer, James Weddell (1787-1834), recorded that by 1825 most Antarctic and sub-Antarctic fur seals were harvested on accessible islands (see Weddell 1825). Weddell recognised that exploitation could not continue indefinitely and stated "the system of extermination was practised ... [and] ... the animals became nearly extinct" (Weddell 1827 in Johanson 1997: 15).

⁹² From 1909 to 1964, Southern elephant seals (*Mirounga leonina*) were harvested for their highly prized oil in the waters around South Georgia, Kerguelén, Heard, McDonald and Macquarie Islands. Sub-Antarctic penguins, including King penguins (*Aptenodytes patagonicus*) and Crested penguins (*Eudyptes spp.*), were also exploited for cooking and cosmetic oil, food and as fuel for fire on islands including South Georgia, Heard and Macquarie (AAD 2002b; Agnew & Nicol 1996). Crabeater (*Lobodon carcinophagus*), Weddell (*Leptonychotes weddellii*), Antarctic fur (*Arctocephalus gazelle*), Leopard (*Hydrurga leptonyx*) and Ross (*Ommatophoca rossii*) seals were also taken regularly in small numbers to feed dog teams or during exploratory sealing ventures (CCAMLR 2002a).

⁹³ Humpback (*Megaptera novaeangliae*) then Blue (*Balaenoptera musculus*) whales were targeted.

⁹⁴ The IWC protected Humpback whales in 1963 and Blue whales in 1964.

(*Patagonotothen guntheri*) and Grey rockcod (*Lepidonotothen squamifrons*). Patagonian and Antarctic toothfish have been more recently targeted by fishers.

Soviet fishers undertook their first krill expedition in the 1961/62 fishing season and commercial fishing started in the 1972/73 fishing season among Soviet and Japanese fleets (Hewitt & Low 2000; McElroy 1984; Nicol 1991; Nicol & Endo 1997). The fishery expanded rapidly with fleets from Chile, Poland and South Korea entering the industry, and it soon concentrated in localised areas in the Atlantic Ocean sector with the main fishing grounds to the east of South Georgia, around the South Orkney Islands and Antarctic Peninsula and off the north coast of the South Shetland Islands (CCAMLR 2002a). According to Nicol and de la Mare (1993), so rapid was the expansion of the krill fishery that it threatened to impact upon the marine ecosystem and characterised the nature of possible future exploitation of marine species. Since 1990, Japanese fishers have taken 50 to 60 per cent of the annual krill catch (Kock *et al.* in press).

In the first 10 years of commercial krill fishing, Antarctic krill catches (particularly those caught by Soviet fishers) were largely used for animal feed. After peaking in 1981/82, when over 500,000 metric tonnes were taken, catches dropped substantially due to technological problems in processing krill and the break-up of the Soviet Union (Nicol & de la Mare 1993). However, difficulties in processing krill were overcome in the mid-1980s. Today, most krill is processed for aquaculture feed, bait and human consumption (Croxall & Nicol 2004). However, problems associated with processing krill contributed to the fishing effort being diverted to finfishing (Kock (1992).

An exploratory pot fishery for crabs (*Lithodidae*) is a recent development in waters around South Georgia and Shag Rocks. It commenced with fishing by the United States in 1992 and two species have been targeted: *Paralomis spinosissima* and to a lesser extent *Paralomis formosa* (Kock 1994). However, crab fishing is not currently economically viable and there have been no target fisheries since the 2002/03 fishing season (CCAMLR 2004f; 2005d). There are also large squid fisheries, which include targeting *Martialia hyadesi*, such as those on the Patagonian and New Zealand shelves and around South Georgia (Kock 1994; CCAMLR 2002c). Until now, only an exploratory fishery has existed and, again, no target fishing for squid has occurred since the 2002/03 fishing season (CCAMLR 2004f; 2005d).

Finfishing in the Southern Ocean dates back to the early days of land-based whaling at South Georgia in 1906 and has paralleled the history of whaling, repeating the pattern of discovery, exploitation and depletion of each new stock (Kock 1994). When exploitation began, national governments were not required to report catches from fishing areas and consequently little is known about the historical size, ecology and extent of these fisheries. Despite this lack of information, downwards trends in fish stocks primarily reflect large-scale harvesting impacts.

However, commercial finfishing began as a trawl fishery in the late-1960s and early-1970s (see AAD 2002b; Agnew 1997; Agnew & Nicol 1996; Nicol & de la Mare 1993). Nearly 60 per cent of all legitimate finfish catch in Antarctic waters between 1969 and 1997 took place around South Georgia (Moody Marine Ltd 2004). In particular, substantial exploitation began in 1969 when Soviet and other Eastern Bloc fishing operations expanded and heavily targeted the bottom dwelling Marbled rockcod, and the shallow dwelling Mackerel icefish in the South Atlantic, particularly around South Georgia and the Kerguelén Islands (Kock 1994; Kock *et al.* 1985; Constable 2002). In the two years from 1969, the Marbled rockcod had almost disappeared from around South Georgia, by the end of the 1970s it was depleted throughout the Southern Ocean, and it currently remains at less than five per cent of its pre-exploitation abundance (AAD 2005d; Miller *et al.* 2004).⁹⁵

By the end of the 1996/97 season, CCAMLR (2002a) estimates that over three million metric tonnes of finfish had been taken from the Southern Ocean. About two million metric tonnes were caught in the Atlantic Ocean sector, with over 80 per cent being taken from close to South Georgia. Of the 924,000 metric tonnes caught in the Indian Ocean sector, nearly 95 per cent was taken near the Kerguelén Islands. Today, the most important Southern Ocean fisheries are located along the Scotia Arc, Ob and Lena Seamounts, Crozet Islands and the Kerguelén Plateau (Agnew 1997; Agnew & Phegan 1995; Knox 1994). Most notably, once the Marbled rockcod catches were reduced to commercially unviable levels, only Mackerel icefish and Patagonian toothfish fishing grounds had sufficiently large populations to support commercial Southern Ocean fisheries (Williams & de la Mare 1995).⁹⁶ This discussion illustrates how various marine species became transformed from natural wild creatures into social marine resources that were commodified and reconstituted into private property. It also highlights how hunters and fishers became increasingly powerful in the actor-network through their ability to mobilise intermediary actor-networks such as fishing vessels and procedures and technologies to harvest marine resources in distant and hostile waters.

3.5 International framework for managing the Patagonian toothfish

3.5.1 Antarctic Treaty System

The origins of the Convention on the Conservation of Antarctic Marine Living Resources date from the 1950s. Until that time, the IWC was the only international body managing the exploitation of Southern Ocean marine species (see Anderson 1999; Mitchell 1998; Tonnessen 1982). Formal negotiations among national governments

⁹⁵ By the end of the 1980s, fishing for most species was either prohibited, as in the case of the Marbled rockcod, or limited by CCAMLR members and coastal States in the Southern Ocean. Some stocks, such as the Marbled rockcod, show little sign of recovery in most areas.

⁹⁶ Mackerel icefish was targeted around South Georgia, Kerguelén and Heard Islands by Soviet fishers when Marbled rockcod stocks declined in the mid-1970s (Constable 2002). Mackerel icefish was the only viable fishery to remain from the *Notothenid* fisheries prior to the establishment of CCAMLR.

with an interest in Antarctic affairs in the late-1950s culminated in the signing of the Antarctic Treaty in 1959 at the *Washington Conference* and it was agreed that Antarctica should “not become the scene or object of international discord” (The Antarctic Treaty 1959).⁹⁷ The Treaty entered into force in June 1961 and remains in force indefinitely. It furthers the purposes and principles embodied in the 1945 Charter of the United Nations and designates the whole of the continent and its dependent marine ecosystems as a “natural reserve devoted to peace and science” (The Madrid Protocol 1991 Article 2).⁹⁸ The Antarctic Treaty forms the foundation for the Antarctic Treaty System (ATS) that consists of a number of separate international instruments and their associated measures that have been developed by ATCPs to manage activities in the Antarctic, while protecting national interests (BAS 2004; Fallon & Kriwoken 2005).⁹⁹ As such, national governments agreed that the Antarctic needed to be managed and they formed an actor-network to collectively act in this regard (see Callon 1986; Kendell & Wickham 1998; Selman & Wragg 1999). The relatively convergent, durable and extended actor-network that emerged comprises the ATCPs and other actor-networks, and the intermediaries that connect them, which include Antarctic Treaty Consultative Meetings (ATCMs) and other negotiations and the international instruments and their associated measures. The ATCM embodies a black-box that speaks on behalf of the ATCPs and acts at a distance and, because the Antarctic Treaty has become accepted by a wide range of actor-networks, its text stabilises the *Antarctic Treaty Sub-network*.

The Antarctic Treaty applies to the area south of 60°S, and includes the Antarctic continent and its surrounding maritime space (The Antarctic Treaty 1959 Article VI; see also Headland 1999; Vidas 2000). It is open for accession by any UN member or any State which demonstrates its commitment to the Antarctic by conducting significant research (BAS 2004; Heap 1994). Forty-five States are members of the Antarctic Treaty, including 27 ATCPs that hold consultative status and 18 Acceding States. The national delegations they form comprise government, scientific, industry and NGO actor-networks. They make decisions on the Antarctic (including the interrelationship between State sovereignty and international cooperation) by consensus, and vote at ATCMs.

⁹⁷ The Antarctic Treaty was signed by the seven Antarctic territorial claimants (Australia, Argentina, Chile, France, New Zealand, Norway and United Kingdom) and five other states (Belgium, Japan, South Africa, the United States and the former Soviet Union).

⁹⁸ The first President of the *Third United Nations Conference on the Law of the Sea* (LOSC 3), Hamilton Shirley Amerasinghe, described Antarctica in 1975 as “an area ... where opportunities remain for constructive and peaceful cooperation on the part of the international community for the common good of all, rather than the benefit of a few” (see Beck 1986: 279).

⁹⁹ The ATS consists of: the Antarctic Treaty (1961); the Agreed Measures for the Conservation of Antarctic Fauna and Flora (CAFF) (1964); the Convention on the Conservation of Antarctic Seals (CCAS) (1972); the Convention on the Conservation of Antarctic Marine Living Resources (1981); the Protocol on Environmental Protection to the Antarctic Treaty (The Madrid Protocol) (1991); and recommendations of ATCMs and several Special Meetings in the form of decisions, measures and resolutions (Fallon & Kriwoken 2005).

While the Antarctic Treaty was initially designed to resolve tensions over sovereignty, the freedom of scientific research, and the potential militarisation of the continent during the Cold War (1945 to 1991), the ATCPs were also committed to protecting the Antarctic environment (Rothwell 1998).¹⁰⁰ Nonetheless, during the 1980s, ATCPs debated the need for an Antarctic minerals regime. The 1988 Convention on the Regulation of Antarctic Mineral Resource Activities (CRAMRA) was eventually adopted, although it was abandoned in 1991 when the need to develop more extensive conservation measures for the Antarctic environment became evident. In response to the squeezing of the debate through this new OPP, the Protocol on Environmental Protection on the Antarctic Treaty (the Madrid Protocol)¹⁰¹ was negotiated in October 1991 and entered into force in January 1998 after being ratified by the then 27 ATCPs.¹⁰² Overall, the adoption of the various instruments of the ATS extended the regional *Antarctic Treaty Sub-network* and signified that ATCPs have increasingly sought to protect the Antarctic environment particularly with regard to resource management.

Instability arose in the ATS with respect to the ATCPs being unable to exert power and influence other actor-networks accessing the Southern Ocean and exploiting its marine living resources. The pressure to protect the Southern Ocean ecosystem arose when the ATCPs recognised that the ATS was unable to fulfil its role as an ocean management regime and became concerned about over-exploitation of fish stocks by an overcapitalised and technically sophisticated fishing industry whose members had relocated to the region (Bialek 2003; CEC 2001; Vidas 2000). These operators had been displaced from European fishing grounds after the collapse of the cod stocks off New England and eastern Canada and the introduction of the EU *Common Fisheries Policy* (CFP) in 1983 (Johanson 1997; Pauly *et al.* 2002; Symes 2001; UN 1978).¹⁰³ They responded to fears of over-fishing of krill stocks (given that krill forms a pivotal link in the Antarctic marine food chain) and the realisation that a more focused regime was needed to conserve Antarctic marine living resources, and forged the Convention on the

¹⁰⁰ The success of the ATS can be measured through its growth in membership (BAS 2004). The 27 ATCPs are: Argentina, Australia, Belgium, Brazil, Bulgaria, Chile, China, Ecuador, Finland, France, Germany, India, Italy, Japan, the Republic of Korea, The Netherlands, New Zealand, Norway, Peru, Poland, Russia, South Africa, Spain, Sweden, the United Kingdom, the United States and Uruguay. The 18 Acceding States are: Austria, Canada, Colombia, Cuba, Czech Republic, Democratic Peoples Republic of Korea, Denmark, Estonia, Greece, Guatemala, Hungary, Papua New Guinea, Romania, Slovak Republic, Switzerland, Turkey, Ukraine and Venezuela.

¹⁰¹ The Madrid Protocol marked an important accomplishment in international environmental law as "it bans mining in Antarctica for a minimum of 50 years" from 1998 (Fallon & Kriwoken 2005: 68). Although it can continue indefinitely, technically, after 2048 any State can call for a review of the mining ban. An opt-out clause in the Madrid Protocol allows States to pull legitimately out of the agreement (but still remain a member of the ATS) if they do not support an extension of the mining ban.

¹⁰² Ratification involves enacting the necessary legislation to give domestic effect to that treaty. The latest ATCP, Estonia, acceded to the Antarctic Treaty in May 2001.

¹⁰³ The European Community introduced the CFP after fish stocks declined and EEZs were declared by coastal States (see Bromley 1997). For Johanson (1997: 260), "over one quarter of the EU catch is harvested from international waters or those controlled by non-EU members." Ecosystem considerations did not initially play an important part in the CFP, and only occurred after 1997.

Conservation of Antarctic Marine Living Resources as a consequence of recommendations made initially at ATCMs VIII and IX in 1975 and 1977 respectively (Fallon & Stratford 2003a).

3.5.2 Scientific Committee on Antarctic Research

The Convention on the Conservation of Antarctic Marine Living Resources negotiations were heavily influenced by the activities and contributions of scientific actor-networks associated with the Scientific Committee on Antarctic Research (SCAR). Older than the Antarctic Treaty itself, SCAR is an international, interdisciplinary, scientific NGO based at the Scott Polar Research Institute in Cambridge, England, that draws on the experience and expertise of scientists from around the world who are active in Antarctic research (SCAR 2005). SCAR relies on government resources and directions. Its members are observers who are able to express their opinions freely rather than act under this organisation's instructions and delegated authority, and who maintain their independence from the political pressures from governments (Darby 1994).¹⁰⁴ They have sought political neutrality and have aimed to provide expert scientific advice and coordinate Antarctic scientific activity to frame scientific programs of circumpolar scope and significance (see AAD 2005c; Heap 1994). In this light, scientists actively promoted the authority of science and became a powerful network of actors because they were able to convince other actor-networks that scientific knowledge provided greater certainty on which to base fishery management decisions. As such, they enrolled other actor-networks into their own global scientific sub-network.

The period from the 1950s to the 1970s marks the first era of NGO activity in Antarctic affairs and the extension of the ATS in this regard. During that time, SCAR "was not only the only sole NGO of significance in Antarctic affairs, it served as a central organ of the [ATS] capable of mobilising considerable resources to achieve cooperative scientific objectives" (Herr 1996: 97). SCAR was established in 1957 as a committee member of the international Council of Scientific Unions (ICSU) (ICSU 2005; Johanson 1997). The first delegates to SCAR met in 1958 to coordinate the continuation of scientific work carried out in Antarctica during the International Geophysical Year (IGY) of 1957/58 (Darby 1994). The twelve States involved in Antarctica during this period agreed that political and legal differences should be set aside in the interests of carrying out scientific work in close and peaceful cooperation (Australia 1993) (Section 3.5.1). The considerable influence of SCAR delegates during this period, and the success of the IGY led to these States establishing the Antarctic Treaty in 1959 and explicitly including this organisation in this regime's development. In this regard, the stable sub-network that embodies SCAR became *punctuated* when it was converted into a single node in the ATS. Its observers then attended the *First International Conference on Living Resources of the Southern Ocean*, which was held at Woods Hole,

¹⁰⁴ After 1961, SCAR observers represented national Antarctic science committees (SCAR 2005).

Massachusetts, in 1976. Recommendations from that meeting resulted in the ten-year Biological Investigation of Antarctic Systems and Stocks (BIOMASS) that focused on krill stocks. Along with other scientific associations, including the Scientific Committee on Oceanographic Research (SCOR), Intergovernmental Oceanographic Commission (IOC) and International Association of Biological Oceanography (IABO), SCAR observers made considerable contributions to the BIOMASS program and the management of other Southern Ocean marine living resources.

Today, the *SCAR Sub-network* is smaller and less stable, its members are less influential in Antarctic affairs, and the association's resources are limited. Its membership is closed and conditional upon the national committee applicant being both actively engaged in Antarctic research and part of a national government program.¹⁰⁵ Most notably, once CCAMLR was negotiated and its Scientific Committee and working groups established, SCAR's influence in this forum declined because its observers broke their connections with other CCAMLR actor-networks when they sought to abstain from political and juridical matters, including the formulation of management measures to exploit marine living resources. SCAR has also been excluded as an information exchange/oversight mechanism or scientific advice coordinator at CCAMLR meetings since the more recent inception of the ATCM Committee on Environmental Protection (CEP). Despite SCAR's declining influence in Southern Ocean affairs, it has maintained its connections with the ATCM and continues to exert considerable influence in this particular forum.

3.5.3 Convention for the Conservation of Marine Living Resources

The Convention on the Conservation of Antarctic Marine Living Resources was adopted in May 1980 and entered into force in April 1982, and it remains in force indefinitely.¹⁰⁶ It was negotiated to ensure the protection of the marine ecosystem and is considered innovative; being the first RFMO to take an ecosystem approach to fisheries management and a precautionary approach (Constable 2002; Constable *et al.* 2000; Miller *et al.* 2004; Rothwell 1998).¹⁰⁷ As such, marine species are extracted from the *Southern Ocean Sub-network* and *punctuated* into nodes that connect successfully with the *CCAMLR Sub-network* when they are reconstituted by various actor-networks from wild animals to fishery resources to be managed and conserved. The text of the Convention squeezes the debate through an OPP where rational use of species is permitted but harvesting must be based on ecological principles listed in the Convention on the Conservation of Antarctic Marine Living Resources Article II (CAMLR Convention 1980). This Article aims to avoid ecosystem changes that are irreversible in 20 to 30 years and reduce a population to levels below those which ensure its stable

¹⁰⁵ SCAR has a continuing executive and a biennial meeting, and has working groups and specialists.

¹⁰⁶ The original signatories to the Convention on the Conservation of Antarctic Marine Living Resources participated in the 1980 *CAMLR Conference* held in Canberra, Australia, and included: Australia, Argentina, Belgium, Chile, France, Germany, Japan, New Zealand, Norway, Poland, South Africa, the United Kingdom and the United States.

¹⁰⁷ See FAO (1999a) for details on the role of RFMOs in conservation and management of fisheries.

Other Contracting Parties (Acceding States) not members of CCAMLR are Bulgaria, Canada, Finland, Greece, Mauritius,¹⁰⁸ Netherlands, Peru, and Vanuatu. The Cook Islands were also invited to the twenty-fourth CCAMLR meeting in 2005 after depositing its Instrument of Accession to the Convention, and an additional 18 non-Contracting Parties were invited as observers (CCAMLR XXIV 2005g).¹⁰⁹ Membership costs approximately US\$121,000 “depending on participation in the fishery”, although a base rate of approximately US\$79,000 can be applied (Miller in Bassett 2004: 46). In this respect, CCAMLR members squeeze the Southern Ocean management debate through their own OPP, and because the Convention on the Conservation of Antarctic Marine Living Resources has become accepted by a wide range of actor-networks, its text stabilises the durable *CCAMLR Sub-network*.

CCAMLR fulfils all criteria identified by the Union of International Associations (UIA) as vital to the legitimate functioning of an IGO (see UIA 1976/77).¹¹⁰ It is both a secretariat and a forum where adoption and implementation of the ecosystem approach to marine living resource management is achieved.¹¹¹ Here, CCAMLR members and Contracting Parties come together in delegations comprising government, scientific, industry and NGO actor-networks at the annual multi-lateral forum to debate various scientific, fishing and conservation interests and issues. They also negotiate agreements on management measures by consensus decision-making and sovereignty norms under Article XII of the Convention on the Conservation of Antarctic Marine Living Resources such that each member has a veto but the measures are enforceable and acceptable to all Parties (see CAMLR Convention 1980; Joyner 1992; Miller 2002; Rothwell 1998; Scientific Certification Systems Inc. 2005). Like all such international negotiations, specific issues may be used as bargaining chips to secure preferred outcomes for national delegations. Tremendous pressure can be applied to States whose positions might normally lead them to break consensus to reach agreements to which all members can agree. In practice consensus decision-making has proved to be a powerful tool in diluting national interests with respect to specific fishery management measures.

¹⁰⁸ At CCAMLR XXIII in 2004, Mauritius acceded to the Convention on the Conservation of Antarctic Marine Living Resources (Australia 2005g).

¹⁰⁹ Non-Contracting Parties include: Angola, Belize, China, Columbia, Indonesia, Kenya, Madagascar, Malaysia, Mexico, Mozambique, Panama, Philippines, Sao Tome and Principe, Seychelles, Singapore, St Vincent and Grenadines, Thailand and Togo.

¹¹⁰ Founded in 1907 and based in Belgium, the UIA developed criteria to identify IGOs and NGOs.

¹¹¹ CCAMLR (and the ATCM) fulfils all criteria identified by the UIA as vital to an IGO (see UIA 1976/77). Criteria includes the need to be a formal international organisation with voluntary or collective membership with full voting rights from at least two States; having been created by a formal instrument of agreement; and with a constitution giving members the right to elect governing bodies and officers. IGOs need continuity of operation, regular plenary sessions and a permanent headquarters; a budget sourced from at least two States with no attempt to make profits for direct distribution to members; to exist independently; and for its current activities to be made publicly available (see also Archer 1983; Birnie & Boyle 1992). IGOs became influential following the *Conference of Vienna* in 1815, and the establishment of the *Rhine Commission* was the precursor for the current political cooperation in the UN.

Once the lid of the CCAMLR *actor-network box* is opened, it is seen to consist of other complex associations that comprise advisory committees and working groups (see Callon 1987). These groups reflect individual interests and smaller interest-driven sub-networks within CCAMLR, each with their own accepted OPPs that relates to specific objectives but encompass the wider ambit of the Convention on the Conservation of Antarctic Marine Living Resources. As such, CCAMLR is a powerful head-actor that speaks on behalf of other actors and networks, and to this extent the regional *CCAMLR Sub-network* has become stabilised to a certain degree as a black box. For example, the CCAMLR Secretariat conducts administrative and organisational tasks and is supported by the Scientific Advisory Committee (SC-CCAMLR), Standing Committee for Administration and Finance (SCAF) and Standing Committee on Implementation and Compliance (SCIC) (see Figure 2.8). Notably, Article IX of the Convention on the Conservation of Antarctic Marine Living Resources stipulates that the Commission base its decisions upon information and advice from the SC-CCAMLR (CCAMLR Convention 1980). The SC-CCAMLR is comprised of representatives from each full CCAMLR member and is assisted by three working groups: Ecosystem Monitoring and Management (WG-EMM), Fish Stock Assessment (WG-FSA) and Incidental Mortality Associated with Longline Fisheries (WG-IMALF). On occasion, *ad hoc* Working Groups have been created to deal with specific matters. These committees and groups meet annually to review and implement access rights in the form of TAC quotas for particular species in specific statistical sub-areas in the Convention Area (FMNH 2004).¹¹² CCAMLR members also invite a range of other organisations to attend Commission meetings as observers to promote a degree of transparency. However, not all these organisations take up the invitation. IGO actor-networks who have recently attended CCAMLR meetings include ASOC, CEP, COLTO, Commission on the South Pacific (CPPS), FAO, IWC, SCAR and IUCN (CCAMLR XXIII 2004a).

The Convention on the Conservation of Antarctic Marine Living Resources is arguably more inclusive than the Antarctic Treaty as it expanded the criteria for membership to connect with States participating in fishing as well as those with a scientific involvement in the ATS (CCAMLR Convention 1980 Article VII(2)(b); Davis 1996). As such, CCAMLR members have adopted a bifocal approach to sovereignty and coastal State jurisdictional issues in order to avoid conflict between claimant and non-claimant States within the ATS and over their control of territory and resources. Despite the

¹¹² Access rights are defined as the rights to fish in a fishery (not a right to the fish *per se*), which are market orientated and characterised by duration, exclusivity, quality of the title and transferability (Scott 2000; UN 2000). All fisheries operate under some form of fishery access rights that may be: (1) general rights to harvest high seas resources according to LOSC; (2) specific rights to harvest a certain resource in a particular area and time-frame; (3) historical rights; (4) formal rights such as the sovereign rights of coastal States; or (5) area-based/territorial use rights (UN 2000). Rights to a fishery may be further divided into: (1) limited entry or access rights that authorises entry into a specific fishery; (2) input rights that limits fishing effort; and (3) output rights or catch limits to catch a specific TAC. Output rights may include Community Development Quotas (CDQs), Individual Transferable Quotas (ITQs) or Individual Non-Transferable Quotas (INTQ). In addition, the global TAC for any given quota species is the total catch by all concession holders that may be taken during a fishing season subject to relevant provisions.

Convention on the Conservation of Antarctic Marine Living Resources having its own mandate and CCAMLR members taking a bifocal approach to protect national interests, the connections of the Convention on the Conservation of Antarctic Marine Living Resources to the ATS are clearly stated, both within its legal structures (particularly Articles III and V) and through its preamble (CAMLRL Convention 1980; Stokke 1996). In addition, it continues the authority of the ATS over Antarctic affairs in light of the increasing interest among other external actor-networks, including the FAO. These linkages bind present and future CCAMLR members that are not parties to the Antarctic Treaty to its basic principles. The linkages also *punctuate* the *CCAMLR Sub-network* into a single node in the ATS.

At the same time, when the Convention on the Conservation of Antarctic Marine Living Resources was negotiated, some States challenged the moral and legal mandate of the regime when they failed to support mutually agreed sovereignty arrangements for coastal States claiming maritime zones around territorial waters that lie inside the Convention Area. This is an important issue because these States continue to act in a dissident manner when they exercise jurisdictional control over Patagonian toothfish fisheries regardless of the stocks being trans-boundary and crossing territorial borders. In this case, ATCPs recognised that extending the Antarctic Treaty Area beyond 60°S to include the Antarctic marine ecosystem as far north as the Antarctic Convergence involved islands that, for the most part, were undisputed sovereign territories (see Rothwell 1998). Complex sovereignty issues arose. In particular, a specific exemption from the strict application of the Convention was sought and obtained by France during the negotiation process. This exemption is significant because it exemplifies how the national interests of France overrode the common interests of other CCAMLR members or the ecosystem. Negotiation at the 1980 *CCAMLR Conference* held in Canberra, Australia, noted that measures already in place for the conservation of marine living resources in the waters adjacent to the French-claimed Kerguelén and Crozet islands would remain in place until modified by France acting within the framework of the Convention (CCAMLR XXIV 2004g). In addition, France retained the power to exclude the waters surrounding the two islands from considerations during deliberations over the implementation of CCAMLR conservation measures. Therefore, France retains jurisdictional power to adopt and enforce CCAMLR conservation measure within its territorial waters.

Consequently, a statement by the Chairman was appended to the Convention on the Conservation of Antarctic Marine Living Resources that preserves the rights of ATCPs to exercise coastal State jurisdiction over resources in their coastal State waters (CAMLRL Convention 1980; CCAMLR 2004g: 23-24). In particular, the French Government has made many reservations to protect its sovereign rights around the French external territorial waters around the Kerguelén and Crozet Islands and the South African Government has become increasingly active in protecting its sovereign

rights around Prince Edward and Marion Islands (PEMI). To date, neither Australia nor the United Kingdom have made formal reservations under the *Chairman's Statement*. This discussion highlights how the moral and legal mandate of CCAMLR is challenged and the actor-network destabilised when its members act in a dissident manner and invoke the *Chairman's Statement* to hold power in localised national sub-networks.

The legality of the *Chairman's Statement* has been questioned by several CCAMLR members who contend that it does not form part of the Convention (CCAMLR XIV 1995 §15.1-§15.2). However, under the 1969 Vienna Convention on the Law of Treaties (hereafter the Vienna Treaty) the *Chairman's Statement* has legal standing similar to the Convention on the Conservation of Antarctic Marine Living Resources itself because Article IV 23b preserves the right of Parties to exercise their coastal State jurisdiction (see Vienna Treaty 1969). However, the adoption of the *Chairman's Statement* is ambiguous because it allows the interpretation on State sovereignty to be extended to the existence of sovereignty but not necessarily to the substantive exercise of sovereignty. For example, sovereignty could be claimed by more than one State, such as Falkland Islands/Islas Malvinas, but could be interpreted in favour of one State that is able to proclaim sovereignty, in this case the United Kingdom. In addition, this approach has important consequences for Australia considering that the sovereignty over HIMI is uncontested despite Australia not invoking this rule. Therefore, a claimant State views its claims to territory within the Convention Area as unaffected by the Convention on the Conservation of Antarctic Marine Living Resources. Simultaneously, the Convention safeguards the legal basis of any opposition should the State attempt to exercise coastal State jurisdiction based upon its claims within the Convention Area. This bifocal approach seeks to maintain the status quo as established by the Antarctic Treaty (CAMLR Convention 1980 Article IV(2)).

Unlike most RFMOs, CCAMLR members apply to the Southern Ocean an Olympic-style fishery allocation system that is based on abundance assessments derived from small-scale research units (SSRUs) and effort in the past fishing season where “a race for the fish ends with the closure of the fishing season as soon as the TAC is reached” (Molenaar 2003: 467).¹¹³ An abstract GYM was also developed in the mid-1990s by CCAMLR scientists to set precautionary catch limits under conditions of uncertainty for most fisheries in the Convention Area (see Bax & Laevastu 1990; Butterworth *et al.* 1991; Constable & de la Mare 1996). This model built on approaches that had already been developed for the Krill Yield Model (KYM) in the late-1980s and early-1990s (see Constable 2005; Kock *et al.* in press; Hewitt & Low 2000). It estimates the abundance of recruits, applies a decision rule with an escapement rate of 50 per cent, and projects these figures forward to enable the known catches to be discounted from the population

¹¹³ In the Convention Area the fishing season extends from 1 December to 30 November, or until the TAC is reached, whichever is sooner (AFMA 2002; CCAMLR XXI 2002c; CCAMLR XXIII 2004a). The TAC is the total weight of fish of a target species that may be taken under national Statutory Fishing Rights (SFRs) in a fishing season. A SFR is the right to take a particular proportion of the total TAC.

and so permits an assessment of the long-term annual yield in metric tonnes (Croxall & Nicol 2004). In particular, recruitment estimates have enabled annual yields to be calculated for the Patagonian toothfish fisheries that have been established from scientific data collected from around South Georgia and Heard Island. Here, the development of the GYM and TAC allocations by scientists have considerable transformative powers because collectively, they successfully reconstitute the Patagonian toothfish from a wild animal into a collective, scaled and modelled fishery resource to be rationally managed, utilised and conserved (see Holm 2001; 2002).

Most significantly, through their associations with the Patagonian toothfish, CCAMLR members have re-aligned the *CCAMLR Sub-network* by re-orienting CCAMLR's management activities towards this species and making it a key actor-network in CCAMLR. They have endeavoured to normalise the actor-network by mobilising intermediaries such as the application of uniform CCAMLR conservation measures to regulate the toothfish fisheries, and by supporting punitive arrangements to police the Convention Area more effectively in accordance with the sustainable exploitation of resources and precautionary principles set out in Article II and Article IX of the Convention on the Conservation of Antarctic Marine Living Resources (CAMLR Convention 1980). CCAMLR members have also introduced nearly 100 conservation measures developed by consensus to conserve the Southern Ocean marine resources based on advice from the SC-CCAMLR and its subgroups (Miller *et al.* 2004). They also set research requirements and programs for licensed fishers, and work to improve international cooperation, data exchange and understanding of the stock and ecological linkages that exist in various fisheries in Antarctic and sub-Antarctic regions. Member governments translate these conservation measures to the national level by mobilising national laws. However, measures that apply to harvesting activities are implemented solely through the flag State and parties cannot enforce measures on another party's vessels. Despite this constraint, Article X allows parties to advise the Commission of the other party's transgressions (CAMLR Convention 1980 Article X). Once adopted, CCAMLR conservation measures are binding on Parties 180 days after notification (Article IX (6)).

Enforcement mechanisms are detailed in Article XXI of the Convention on the Conservation of Antarctic Marine Living Resources where obligations are imposed on the Parties to take appropriate measures within their competence to ensure compliance with CCAMLR conservation measures. In addition to setting measures, CCAMLR members also developed the 100 per cent mandatory *Scheme of International Scientific Observation* (hereafter the observer scheme) in 1992 (see CAMLR Convention 1980 Article XXIV; Sabourenkov & Appleyard 2005; Tuck *et al.* 2003). Under this scheme, all licensed fishers are required to carry an official observer/inspector onboard vessels whose crews are engaged in either scientific research or the harvesting of marine living resources. That official is required "to observe and report on the operation of fishing

activities in the Convention Area” with the objectives and principles of CCAMLR in mind (CCAMLR 1992 Part 10 Annex 1). The scheme also provides for high seas boarding and inspection of such vessels.¹¹⁴ Other regulatory measures that squeeze the management debate have been considered by CCAMLR members, and the key measures are detailed in Table 3.1.

Table 3.1: Development of the main CCAMLR conservation measures in the Patagonian and Antarctic toothfish fisheries

Date	CCAMLR information/action	CCAMLR conservation measure (CM)
1990/91	Slight increase of information TAC for Patagonian toothfish set	CM 24/IX – first introduced catch limits in the Patagonian toothfish longline fishery for the 1990/91 season CM 26/IX – required the reporting of seabird entanglement and mortality in the toothfish longline fishery
1991/92	First estimates of seabird mortality	CM 29/X (now 25-02 [2003]) – applied mitigating measures to reduce incidental seabird bycatch from 1991 CM 30/X (now 25-03 [2003]) – minimised incidental mortality of seabirds and marine mammals in the course of trawl fishing from 1994
1992/93	Further information on bycatch	CM 29/XI – introduced to reduce seabird bycatch including compulsory observer coverage, streamer lines, prohibition of offal discharge and the restriction to night setting of longlines
1993/94	Bycatch mitigation measures developed	CM 29/XII – to minimise incidental seabird bycatch a TAC of 1,300 metric tonnes was set at South Georgia CM 63/XII (now 25-01 [1996]) – regulates the use of plastic packaging bands on fishing vessels
1994/95	Publication on how to set longlines correctly	CM 29/XIII – to minimise incidental seabird bycatch a TAC of 2,800 metric tonnes was set at South Georgia
1995/96	CCAMLR 1996 Handbook, <i>Fish the Sea not the Sky</i>	CM 29/XIV – to minimise incidental seabird bycatch a TAC of 4,000 metric tonnes was set at South Georgia
1996/97	IUU fishing terminology developed	CM 29/XV – to minimise incidental seabird bycatch a TAC of 5,000 metric tonnes set for South Georgia; precautionary TACs all other areas
1997/98	High IUU catches Adoption of a Scheme to Promote Compliance by Non-Contracting Party Vessels with CCAMLR CMs	CM 29/XVI – to minimise incidental seabird bycatch a TAC of 3,300 metric tonnes was set at South Georgia CM 118/XVI (now 10-07 [2003]) – obliges Contracting Parties to prohibit toothfish landings from non-Contracting Party vessels unless the fish was caught in compliance with CCAMLR measures
1998/99	High IUU catches First attempts to introduce a vessel monitoring system (VMS), develop a catch documentation scheme (CDS) and monitor trade Closure of the fishery prior to 1 April	CM 119/XVI (now 10-02 [2001]) – prohibits fishing by Contracting Party vessels in Convention Area unless they have a flag State licence setting out the time, place and species to be fished and inspections CM 146/XVII (now 10-01 [1998]) – requires all licensed vessels to mark their fishing vessels and gear appropriately to aid identification CM 170/XVIII (now 10-05 [2003]) – requires CCAMLR members to implement a CDS for toothfish to document international trade
1999/00	Adoption of CDS High IUU catches in some areas of the Southern Ocean	CM 29/XIX (now 25-02 [2003]) – amended in November 2,000 to better capture alternative line weighting regimes and the discharge of offal CM 147/XVII (now 10-03 [2002]) – requires in port inspections of all toothfish vessels licensed by Contracting Parties in the Convention Area
2000/01	CDS in operation and VMS supported	CM 148/XVII (now 10-04 [2002]) – requires fin fishing vessels to install a mandatory and automated satellite-linked VMS

¹¹⁴ Observers monitor fishery operations, catch and ecosystem interactions and vessel compliance to CCAMLR conservation measures (Tuck *et al.* 2003). Only enforcement is limited to the flag State.

Date	CCAMLR information/action	CCAMLR conservation measure (CM)
2001/02	Precautionary catch limits set	Precautionary TACs set for South Georgia and all other areas
2002/03	Concern that IUU pressure will increase <i>catastrophic</i> stock declines Approval of a trial web-based electronic CDS (eCDS) <i>IUU Vessel Blacklist</i> supported General conservation measures for exploratory fisheries	A new numbering system for conservation measures proposed at CCAMLR XX to allow the measures to be traced over their history The eCDS and cVMS were proposed to meet the operational standards described in CM 10-05 (2002), CM 10-04 (2002) and 10-05 (2003) CCAMLR members supported the strengthening of the IUU Vessel List under CM 10-06 (2002) and 10-07 (2003) CM 21-02 (2002), 32-09 to 32-16 and 41-01 to 41-11 – Prohibits toothfish fishing except in accordance with conservation measures.
2003/04	Concern about South Georgia stock assessment cVMS adopted ACAP ratified	Apparent, and contested, reduction in IUU fishing by some 75 per cent cVMS to provide for dual reporting (via flag State and or direct from a vessel) of vessel location reports to the CCAMLR Secretariat in Hobart First meeting of ACAP Parties (MoP1) was held in Hobart, Australia
2004/05	cVMS significantly revised Contracting Parties required to provide licence information CCAMLR Symposium, Valdivia, Chile, April 2005	CM 10-04 revised to ensure that Contracting Parties and the CCAMLR Secretariat transmit data and reports using secure Internet protocols including vessel IMO number, beneficial owners and photographs CCAMLR Symposium discussed wide ranging contemporary issues facing CCAMLR members

Adapted from: AAD (2005d; 2006); AFMA (2005b); Agnew (2000); ASOC (2003a); CCAMLR (1996; 2000c; 2002c; 2003c; 2004a); Fallon & Kriwoken (2004); Fallon & Stratford (2003a); Kock (1992; 2001)

These measures include flag State licensing requirements for all fishing vessels; obligations on flag States to prosecute and, if necessary, impose sanctions; and port inspections of landings and shipments.¹¹⁵ Adding to these measures has been the requirement for fishers to mark vessels and shipping gear; and for CCAMLR to introduce an *IUU Fishing Vessel List* to blacklist vessels engaged in non-licensed fishing activities. CCAMLR members and fishers have also been required to develop a paper-based catch documentation scheme (CDS) to track the landings and trade flows of toothfish caught in the Convention Area, and to determine whether traded toothfish have been caught in accordance with CCAMLR conservation measures;¹¹⁶ and establish a tamper-proof, satellite-based and centralised vessel monitoring system (cVMS) to allow for the continuous reporting of a licensed fishing vessel's position in the Convention Area for the duration of the license issued by the flag State.¹¹⁷ In addition, CCAMLR members are urged to promote compliance by Contracting and non-Contracting Parties to CCAMLR conservation measures and encourage non-members to join the Convention (see Campbell & Macdonald 2004; CCAMLR XXIII 2004a). In

¹¹⁵ Port States allow their ports or territorial sea to be used for the landing or trans-shipment of goods. For example, Mauritius has reportedly allowed the landing of fish from illegal fishing vessels operating in the Convention Area (*Examiner* 1998; ISOFISH 1998c, d, e; *The Weekend Australian* 1998).

¹¹⁶ At CCAMLR XVIII in 1999, members adopted the CDS as laid down in Conservation Measure 10-05 (2003). The CDS requires CCAMLR members to document international toothfish trade and certify that the catch has been caught in a manner consistent with CCAMLR conservation measures.

¹¹⁷ To complement the CDS, at CCAMLR XVIII in 1999, CCAMLR members agreed that all vessels licensed to fish Patagonian toothfish be part of the cVMS to allow flag States and CCAMLR to monitor vessel activities (CCAMLR XVIII 1999b). At CCAMLR XXIII in 2004, members adopted the cVMS as laid down in Conservation Measure 10-04 (2002), an *IUU Fishing Vessel List* and the requirement for information about vessels seeking a licence to fish from CCAMLR (CCAMLR XXIII 2004a).

this regard, CCAMLR has drawn the attention of all States, irrespective of whether they are Contracting or Non-Contracting Parties, to consider activities affecting the implementation of the Convention (CCAMLR Convention 1980; Rayfuse 1998). Additional measures developed by CCAMLR members include minimising bycatch, closing fisheries when warranted, reducing pollution and discards, and collecting and submitting fishery data and reporting national CCAMLR activities to the Commission annually (Miller 2002). Overall, the *devil is in the detail* and a State's ability to ensure compliance is subjectively applied and dependent upon what each State interprets as being within their competence to achieve rather than uniform CCAMLR standards.

In summary, the CCAMLR process of black-boxing connects the Convention on the Conservation of Antarctic Marine Living Resources and its members with other global actor-networks by mobilising intermediaries (for example: beliefs, meetings, working groups, conservation measures and documents) and as it becomes normative and less open to negotiation. The influence of actor-networks in the *CCAMLR Sub-network* illustrates how top-down regulation and standardisation of principles, practices and conservation measures can successfully stabilise resource management at a distance (see Dean 1999; Holm 2001; Murdoch 2000; Latour 1997; 1998a, c; Law 1986). In this respect, CCAMLR transforms both nature and society: For example, governments and the global political and economic order, fishers and the organisational structure of the fishing sector, and the scientific community act in certain ways to remain engaged in CCAMLR processes. It also transforms and redefines the Patagonian toothfish, the Southern Ocean ecosystem and nature itself as calculative entities. However, the success and agency of CCAMLR rests upon the degree to which other actor-networks comply with the initiatives and measures developed by CCAMLR members. Consequently, the *CCAMLR Sub-network* can be destabilised at any time when actors and networks break their connections with others and proceed in a dissident manner. In this respect, CCAMLR constitutes a network result rather than a starting point.

3.5.4 International regulatory arena

Harvesting of the Patagonian toothfish is also governed by LOSC and a complex and dynamic mosaic of other interconnected international instruments (see LOSC 1982).¹¹⁸ These instruments have been developed by international institutions and their members with the aim of establishing a durable and stable actor-network of regimes to govern this species and other global fish resources. For Stokke (1999: 159), such linkages are important because features found in one instrument may influence the design of another; or aspects of one instrument “may interact with another casually by influencing its

¹¹⁸ The UN is involved in other marine focused consultative processes such as the United Nations Open-Ended Informal Consultative Process on Oceans and the Law of the Sea (UNICPOLOS), OECD Ministerially-led High Seas Task Force on IUU Fishing and SoFIA reporting (see Global Forum 2004; OECD 2003b; UNICPOLOS 2005).

formation, operation and effectiveness.” The most influential instruments include the:

- voluntary and non-binding 1993 Code of Conduct for Responsible Fisheries (CCRF) (FAO 2000; 2002a);¹¹⁹
- legally binding 1993 Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (the Compliance Agreement) (FAO 2002b; 2003; Haward *et al.* 1998);
- legally binding 1995 Agreement for the Implementation of the Provisions of LOSC relating to the Conservation and Management of High Seas Straddling Fish Stocks and Highly Migratory Fish Stocks (the UN Fish Stocks Agreement) (UN 2001);¹²⁰ and
- voluntary 2001 International Plan of Action on IUU Fishing (IPOA-IUU) that sets out a range of tools to deal with IUU fishing (FAO 2001a; 2002c).¹²¹

The Convention on the Conservation of Antarctic Marine Living Resources and various international instruments that comprise the regional actor-network of international regimes are translated to the national level by national laws that are implemented by governments in State-led sub-networks. In this respect, internationally consistent national laws rely on State interaction and their interconnectedness with international institutions. Within national maritime waters, management of the Patagonian toothfish fisheries remains a matter for domestic regulation and resolution, and States can impose other or additional measures regarding their fishers’ conduct (see Fallon & Kriwoken 2004). On the high seas, flag vessels are subject to the exclusive jurisdiction of the flag State where the “State concedes its flag to a vessel and assumes international responsibility for exercising jurisdiction and control over the vessel” and should ensure the vessel complies with the obligations that stem from LOSC (MAPA 2002: no page). However, fishers can avoid the various national laws by reflagging their vessels with States not party to the various instruments (FOC States) and, therefore, are not obliged to implement obligations into national laws under LOSC Article 94 or the UN Fish Stocks Agreement Articles 18 and 19 (Hayashi 1999; LOSC 1982; UN 2001).¹²² FOC

¹¹⁹ International law distinguishes between legally binding *hard law* and voluntary *soft law* instruments. Soft law instruments often reflect an emerging consensus or principle that might result in a binding instrument or customary international law (Houtte 2004). Edeson (1999) argues that soft law instruments are useful because they support the evolution of new norms and principles (such as the application of the precautionary approach or responsible fishing), and provide a testing ground for new ideas.

¹²⁰ The UN Fish Stocks Agreement entered into force in 2001, and as of July 2005, 52 States were signatories (UN 2001). It legally binds its members to managing and conserving straddling and highly migratory fish stocks within their maritime waters, and dependant species, in a sustainable manner and using an ecosystem management approach (Hayashi 1999; Tsamenyi & McIlgorm 1999). The UN Fish Stocks Agreement also obligates States to establish RFMOs, and non-complying States to not authorise vessels flying their flags to fish straddling or migratory fish stocks which are subject to measures established by that organization (Thebaud 1997).

¹²¹ In March 2001, the IPOA was adopted by consensus by the FAO’s Committee on Fisheries and endorsed by 110 States and the FAO Council in June 2001 (FAO 2001a; 2002c; Trent *et al.* 2005).

¹²² In addition, since States voluntarily apply the powers and obligations of the UN Fish Stocks Agreement, its effectiveness is questioned.

States usually establish open registers and accept vessels regardless of whether they are operating legitimately or illegally, or whether there is a genuine link between the flag State and the vessel or company owning the vessel (see Gianni 2004a; Gianni & Simpson 2004; HSTF 2006; Kimball 2003; Mansfield 2004; NOO 2003; Rigg 2004; Trent *et al.* 2005; Vidas 2000). Or, in order to avoid marketing/landing restrictions, fishers can land fish in States not party to the relevant treaties and not obliged to have landing/marketing laws consistent with treaty obligations. Notably, CCAMLR members use *flag of non-compliance* (FONC) to avoid political sensitivities attached to the term FOC. They emphasise that the choice of flag State for IUU fishing vessels is largely determined by the lack of regulatory control that will be exercised over them regardless of their RFMO status (see Agnew & Barnes 2004; Hatcher 2004; Molenaar 2003).

Problems for States also arise with respect to ecosystem management. When an ecosystem extends over the territory of more than one State, management of the total ecosystem is only possible with the consent of each State involved (Fallon & Stratford 2003a). Jurisdictional issues such as accountability, finance and control arise when establishing rules for total ecosystem management in one or more nations' territorial waters. However, these problems become amplified when dealing with ecosystems solely or partially within international waters where international law has assumed that these waters are *res nullius* or *totally free* and belonging to no one State (Belsky 1986). Until recently, except for controls that a State might have placed on its nationals, no rules or procedure could be established to preclude or control activities in such waters. The application of any common set of rules depended on voluntary acquiescence or the political power of other States, either voluntarily or acting through collective institutions or treaties. Consequently, States must believe that comprehensive management is in their own best interest if common standards are to be established.

Given that human activities are increasingly affecting the Southern Ocean ecosystem and the Patagonian toothfish, effective collective governance has become critical in this region. This is because managing and conserving that environment and the resources found there means managing and influencing human behaviour to encourage conduct that is equitable, respectful and sustainable (see Fallon & Stratford *forthcoming*). In an effort to promote such governance, and over a period of three decades, various actor-networks including national governments, trans-national groups and NGOs have instituted systems of governance for the region. Paramount among them has been the Convention on the Conservation of Antarctic Marine Living Resources, with LOSC serving as a unifying international framework on marine environmental protection and the ATS specifically governing the Antarctic region. However, difficulties have arisen when interpreting the legal status of these regimes or when calculating which of the regimes prevails because these regions are also governed by a complex and changing web of overlapping and concurrent international instruments (for example: the Compliance Agreement or the UN Fish Stocks Agreement) (see Kaye & Rothwell 2002;

Vidas 2000; Wood 2003). These regimes comprise different member States and contain principles, rights and obligations with varying compositions although they do observe the *pacta tertiis* principle.¹²³ This fundamental rule of customary international law dates back to Roman times (Franckx 2000) and was codified in the Vienna Treaty, which states that treaties do not “create either obligations or rights for a third State without its consent” (Vienna Treaty 1969 Section 4 Article 34).

In addition, LOSC does not acknowledge the *primacy* of regional organisations, but creates a duty for States to “cooperate with other States in taking such measures for their respective nationals as may be necessary for the conservation of the living resources of the high seas” (LOSC 1982 Article 117). LOSC also requires that States “cooperate with each other in the conservation and management of living resources in the areas of the high seas ... and establish subregional or regional fisheries organisations to this end” (LOSC 1982 Article 118).¹²⁴ In light of these provisions, when negotiating the Convention on the Conservation of Antarctic Marine Living Resources ATCPs established that, as a question of legal interpretation, a general principle of complementarity exists between LOSC, the Antarctic Treaty and the Convention on the Conservation of Antarctic Marine Living Resources because they are not in conflict (Molenaar 2001).¹²⁵ In September 2000, ATCPs at the XII ATCM held in The Hague, also developed Resolution 2 that calls for the ATCPs to support CCAMLR and its conservation measures so as to combat IUU fishing regardless of their Convention on the Conservation of Antarctic Marine Living Resources membership status (SCAR 2001). In addition, the UN Fish Stocks Agreement allows CCAMLR to be *defined* as the RFMO responsible for managing fishery resources within the Convention Area (see also Joyner 1995). Under these powers, any State party to the UN Fish Stocks Agreement that fishes within the Convention Area must abide by CCAMLR conservation measures regardless of whether it is party to the Convention on the Conservation of Antarctic Marine Living Resources or not. Thus, at the close of the UN Fish Stocks Agreement negotiations, Chairman Ambassador Nandan stated that “the freedom of the high seas no longer exists as it did under the old law of the sea ... it is no longer a free-for-all” (Earth Summit +5 1997: 2).

3.6 Observations

Historically, the remoteness of the Southern Ocean, and dependence upon communication technologies now considered slow, allowed commercial operators to

¹²³ Other international regimes include the 1945 Charter of the United Nations; 1979 Bonn Convention; 1992 CBD and Agenda 21; MARPOL 73/78 and its associated marine pollution Annexes; 1974 International Convention for the Safety of Life at Sea (SOLAS 74) that was drafted in 1914 after the *Titanic* sank, and the 2001 Agreement on the Conservation of Albatrosses and Petrels (ACAP).

¹²⁴ This interpretation is reinforced by the Vienna Treaty that states that if two treaties within their own standing address the same issue, neither treaty takes precedence (Vienna Treaty 1969 Article 30).

¹²⁵ Difficulties remain due to unresolved questions about sovereignty over Antarctica by claimant and a few non-claimant States that compromise the international legitimacy of the ATS.

exploit marine resources without interference from even their States of nationality. However, if the open access principle is applied to current resource activities in the Southern Ocean, the prospect for sustainable harvesting of resources are poor. This prognosis is exemplified by past sealing and whaling practices and more recently, fishing for krill and finfish. For example, reduced finfish stocks have occurred despite the development of CCAMLR conservation measures. Consequently, in a highly capitalised Southern Ocean fishing industry, it makes commercial sense to seek maximum returns on capital outlays, and then capital can be invested elsewhere. Restraint is unlikely to maximise returns as other operators may take the resource, or, if fishers delay harvesting the stock, additional capital may need to be outlaid in the future to secure the resource.

The open access principle is expressed in the Convention on the Conservation of Antarctic Marine Living Resources as it does not limit any State's access to Southern Ocean resources while the State complies with CCAMLR conservation measures (Bush 2002). These measures do not discriminate on the grounds of nationality, and regulation relies on national enforcement; principally by controlling the flag State of the vessel. As a result, the effectiveness of this Convention is vulnerable to dissident third party operations (activities of vessels not flagged by CCAMLR Parties) and the lack of apportionment of a TAC or cap on total fishing effort among commercial operators or CCAMLR members. Finally, the variation between CCAMLR members in their rigor and procedures of domestic implementation, inspection and enforcement can result in dissident operators taking advantage of weaker regulations that may be imposed by some States.

Importantly, the Southern Ocean and Patagonian toothfish comprise a complex natural sub-network that cuts cross territorial and jurisdictional boundaries and overlapping international regimes, and mobilises the forces of nature to hinder the efforts of other actor-networks who seek to harvest fish stocks. In effect, actors in the natural sub-network continually act in a dissident manner over differing spatial scales (see Castree & MacMillan 2001; Latour 1997; Murdoch 1997a, b; Serres 1995). Consequently, the regulation of Patagonian toothfish fishing depends predominantly on the legitimacy and effectiveness of the Convention on the Conservation of Antarctic Marine Living Resources. It also depends on a complex, dynamic and convergent regional actor-network of other international regimes, the changing notion of the freedom of the high seas, and the complementarity that exists between the various instruments and principles. Managing the toothfish also depends upon the resolve of fishers to modify their behaviour and comply with these international regulatory measures, the types of technologies they mobilise in the fishery, and the overall effectiveness of national laws and measures imposed on the fisheries by coastal States in the Southern Ocean.

Nonetheless, notions of appealing to the rights and liberties of actors to act responsibly and to manage their actions appear insufficient to achieve sustainable outcomes for the

Patagonian toothfish. In this light, those governing the toothfish fisheries have needed to consider the conditions of freedom. However, in order to act freely, actors and networks must first be shaped, guided and moulded into entities capable of acting responsibly (see Dean 1999). On one hand, CCAMLR members and national governments have needed to contact, consult, negotiate, and create partnerships with, and empower actors and networks to activate forms of agency, liberty and choice for individuals and communities (such as licensed fishers). Conversely, they have needed to set norms in the form of standards, benchmarks, performance indicators and penalties to monitor, restrict and render calculable the performance of dissident actor-networks (such as States or fishers protecting their interests at the expense of the CCAMLR collective good). The complex *CCAMLR Sub-network* and other international regulatory actor-networks, and the proliferation of government policies, laws and regulations they activate, illustrate that governing the toothfish fisheries may require truth and knowledge that comprises ethics, craft, imagination, strategic thinking, intuition and multiple forms of practical, scientific, technical, punitive and calculative rationality if all actor-networks are to be successfully enrolled. Despite the mixed success of enrolling actors into these actor-networks, there is a growing awareness of limits and the need for precaution in the toothfish fisheries, compelling CCAMLR members and national governments to incorporate a sense of ecological accountability and global governance to managing the Southern Ocean ecosystem and its marine living resources.

Chapter 4

The Toothfish Fisheries

4.1 Introduction

This chapter describes how some actors in sub-networks act at regional and national levels to govern specific Patagonian toothfish populations in a single stock context. Although this species is collectively managed by mobilising a regional actor-network of international regimes that advocate technologies of agency and performance and include the Convention on the Conservation of Antarctic Marine Living Resources and the principles, agreements, measures and fora it embodies, each regional fishery is also managed as a specific entity (see Dean 1999; Law 1999b; Murdoch 2000). In this regard, CCAMLR members not only manage *established* Patagonian toothfish fisheries at the regional level but have developed *new* and *exploratory* Patagonian and Antarctic toothfish fisheries in the Convention Area. However, CCAMLR members also have an ongoing preoccupation with State sovereignty and national security, and each member seeks to protect its national interests such as controlling coastal State fisheries inside the Convention Area. In this vein, Figure 4.1 illustrates that CCAMLR members pressure other States to stabilise and comply with CCAMLR conservation measures as a collective priority by cutting or weakening their links with national interests. This problematisation includes cutting or weakening national links with State-managed Patagonian toothfish stocks, unregulated fishers, rogue States, nationally-focused scientists and researchers, IGOs and NGOs, processors, traders and consumers (see Callon 1986 in Section 2.4.3).

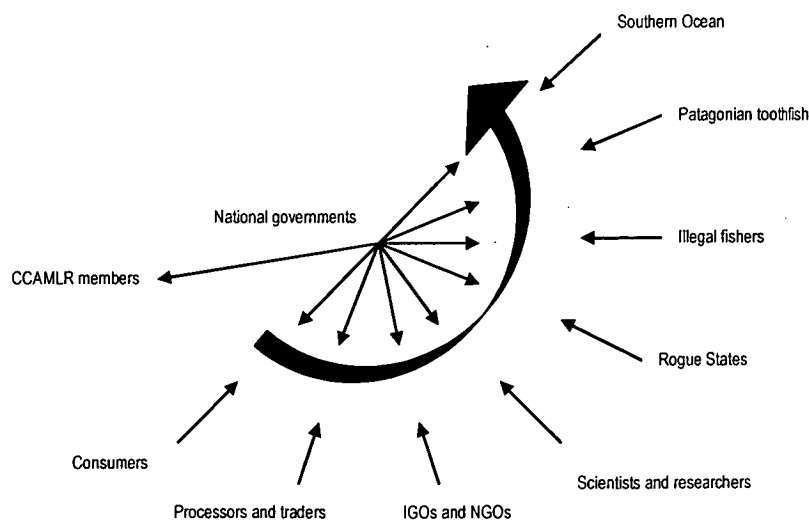


Figure 4.1: *Interessement* on the in-between where the CCAMLR members interest national governments

At the same time, coastal States enact national laws to regulate access to the Patagonian toothfish fisheries located in national maritime waters in the Convention Area. The mechanisms they have developed to manage the fisheries under their jurisdiction, such as policies, principles, management arrangements and consultative processes, highlight the emergence of other regional and national actor-networks. These sub-networks can become *punctuated* and converted into a single node in the *CCAMLR Sub-network* when national governments become CCAMLR members. State actor-networks also seek to *contract* national fishers into national and CCAMLR management obligations and to make their actions calculable and comparable so that harvesting can be maximised. To explain why these state actor-networks seek to govern the Patagonian toothfish fisheries as single stocks, I briefly outline the developments that have led to the expansion of this new and valuable international fishery including the methods used to harvest the stocks. An overview and the technologies of agency and performance that state actor-networks have mobilised to manage single stock CCAMLR and national toothfish fisheries are then described.

4.2 Expansion of Patagonian toothfish fishing

4.2.1 New international fishery

Notwithstanding historical indigenous fishing, exploratory trawl fishing for Patagonian toothfish started as early as 1955 off the Chilean coast (Agnew 2004; Moody Marine Ltd 2004). It was then caught as a shallow-water incidental catch (minor bycatch species) in the mixed bottom-trawl fisheries targeted for Marbled rockcod and Grey Rockcod, around South Georgia/Shag Rocks and Kerguelén Islands from mid-to late-1970s (Constable *et al.* 2000; Constable 2002; Croxall & Nicol 2004) (Section 3.4.2).

Fishing for toothfish has been problematic since large-scale Soviet Union (later Ukrainian) fishing fleets discovered commercial quantities of Patagonian toothfish off the Kerguelén Islands in 1985 (CCAMLR 2002a; Kock 1992). Following the decline of the Mackerel icefish fishery in the mid-1980s, and after the collapse of other over-exploited white-fleshed species in other fishing grounds, such as Orange roughy (*Hoplostethus atlanticus*) and Black cod (*Anoplopoma fimbria*), Patagonian toothfish became an important alternative trawl species. However, the introduction of longlining in 1985/86 around South Georgia (Kock 2001) resulted in exploitation of larger, older fish from areas inaccessible to trawlers. A substantial fishery then began when Spanish operators discovered commercial toothfish stocks off southern Chile in the Pacific Ocean in the late-1980s (Fallon & Kriwoken 2004). The development of longlining lengthened the *Patagonian Toothfish Network*, led to a rapid increase in harvesting during the early-1990s and the expansion of the fishery to the Kerguelén Islands, and then the Falkland Islands and Argentina (AFMA 2001; CQFE 2002a; Gianni 2004b; Kock 1994; Tuck *et al.* 2003). However, it was not until 1996/97 that fishers directed significant attention on the Patagonian toothfish. At this time, fishers progressively

moved eastwards into the slope waters of previously unfished islands, banks and seamounts in the Indian and Pacific Ocean sectors of the Southern Ocean including waters around the islands of South Georgia/Shag Rocks, Prince Edward, Marion, Crozet, Kerguelén, Heard and Macquarie (Agnew 2000; CCAMLR 2002a; FOE Norway 1997). Since 1998, the Antarctic toothfish has also become the target of a number of new and exploratory fisheries, and fishing effort for this species has more recently extended into high-Antarctic coastal waters, including the Ross Sea, Prydz Bay and the East Antarctic regions (AFMA 2005e; Croxall & Nicol 2004; Fleshler 2005; Lack 2001; Stone 2002b).

The Patagonian toothfish fishery is new by global standards with the main fishing nations being Argentina, the Republic of Korea, Chile, France, Australia, the United Kingdom, Uruguay and South Africa (Catarci 2004; Mascoli 2004; TRAFFIC 2001a). It is a valuable international industry where material and other intermediary actor-networks (including procedures and technologies) have connected various actors and networks and increased production, profits and competitiveness. The industry has also been sensitive to the impacts of globalization, which has resulted in the expansion and interconnectedness of international actor-networks across ecological, political, economic, technological, social and cultural flows (see Cole 2003). Many artisanal fishers in this fishery have been transformed from traditional, small-scale, occupational pluralists (when fishing stocks failed and fishers were able to resort to other fisheries or means of subsistence) to professional and specialised deep-sea operators. In some cases, the ties between fishing communities have been disrupted when larger corporations have out-competed smaller operators, such as Norwegian and Spanish interests entering the Argentinean and Chilean artisan Patagonian toothfish fisheries (Appendix C). When toothfish stocks were over-fished, the vulnerability of some national fisheries to fluctuations and uncertainty in fish resources became more acute. At the same time, the international structure of the Patagonian toothfish fishing industry has resulted in advantages for fishers and some communities. For example, international knowledge and markets have provided new opportunities for economic diversification, investment and growth when operators have modernised and upgraded their operations to improve performance, competitiveness and safety and to maintain employment and tax revenues (as exemplified by the developments in the Falkland Islands and La Réunion Island fishing sectors). However, the benefits of developing this international fishery are also contested because many Patagonian toothfish fishing grounds have been quickly exhausted when they were accessed by fishers from many States.

4.2.2 Trawling, longlining and pot fishing

Fishing effort for Patagonian toothfish is concentrated from May to July during the Antarctic winter, in part to reduce seabird interactions; whereas fishing effort for Antarctic toothfish is concentrated from October to March during the Antarctic summer when conditions are less hostile. Fishers use different techniques (that comprise

inhuman material actor-networks such as fishing vessels, gear and communication technologies and other intermediary actor-networks such as fishing fora where they forward their interests) to gain access to fishing grounds and to harvest toothfish stocks. Trawling and longlining are predominantly used in the Convention Area although some pot fishing has been trialled (see Agnew *et al.* 2001; Australia 2005b, g; 2006). In this respect, actor-networks including fishers and fishing vessels, technology, data and knowledge extract the Patagonian toothfish from its context – the Southern Ocean.

Demersal longlining is the most common method of setting lines in the Patagonian toothfish fisheries because it is a highly efficient technique (Bjordal & Løkkeborg 1996; Fallon & Stratford 2003a). However, different methods may use a wide variety of adaptations depending on local conditions. This technique generally involves setting a mainline (also called groundline or motherline) with many individual baited hooks on branchlines (also called snoods, secondary lines, ganglions or ganglines) (Ashford 2001; Preston *et al.* 1998). Some longliners set lines of over 130 kilometres with more than 20,000 hooks attached, although they vary considerably in length and number of hooks (Birdlife International 2001). They are set at depths ranging from 500 to 2,500 metres, with the mainline being oriented vertically or horizontally and laid on the seabed with anchors, buoys, buoy lines and radio beacons at both ends (AAD 2001b).

The Spanish longline method is labour intensive and mainly used by Argentinean, Chilean and Uruguayan fishers (Alexander *et al.* 1997). Two parallel lines are employed: a thin mainline that holds the branchlines and hooks, and a thicker and heavier hauling or safety line (usually 15 to 20 millimetre diameter) that is unweighted and floats above the mainline (Bjordal & Løkkeborg 1996; ISOFISH 2002a; Kock 2001). The fishing line is weighted at 20 metre intervals and between each weight are 30 hooks on one metre long nylon snoods. The bait (half frozen fish and/or squid) is manually attached to the hooks (Kock 2001). This technique is used in areas where strong currents and rough sea floors otherwise cause high gear loss. The safety line allows the mainline to be retrieved at the next linkage point to the safety line even if it breaks. Many fishing lines can be deployed during a single set. According to ISOFISH (2002a), approximately 80 per cent of illegal fishing vessels use the Spanish longlining method, as opposed to the more expensive Norwegian autolining/Mustad method.

The Norwegian autolining/Mustad method was developed especially for the Patagonian toothfish fishery (Figure 4.2). It typically employs a single longline 70 to 130 kilometres in length and a simple motherline (usually 9 to 12 millimetre diameter) to which are attached several thousand baited branchlines up to one metre in length (AFMA 2005e) (Figure 4.2). However, in the toothfish fisheries, this method generally employs longlines of up to 15 kilometres with between 5,000 and 15,000 baited hooks per cast (Tuck *et al.* 2003). Each set takes between one and four hours to complete, and hauling can take between eight and thirteen hours. ISOFISH (2002a) identifies that the line used is exceptionally thick (in general 11.5 millimetre diameter) to tolerate the

stresses of deep-sea fishing. This system uses automatic baiting where the bait is attached with 70 to 90 per cent efficiency immediately prior to shooting the longline (Løkkeborg 1999). According to O. Mustad & Sons A.S. (date unknown), this method allows vessels to operate in rougher weather conditions as no pre-baiting is required, and hauling speed is increased where 2,500 to 3,000 hooks can be hauled per person each day (see also AFMA 2005e). In addition, it has the potential to be less labour intensive and most Norwegian/Mustad-equipped factory vessels can operate with fewer crew members than those using the Spanish method (Tuck *et al.* 2003).

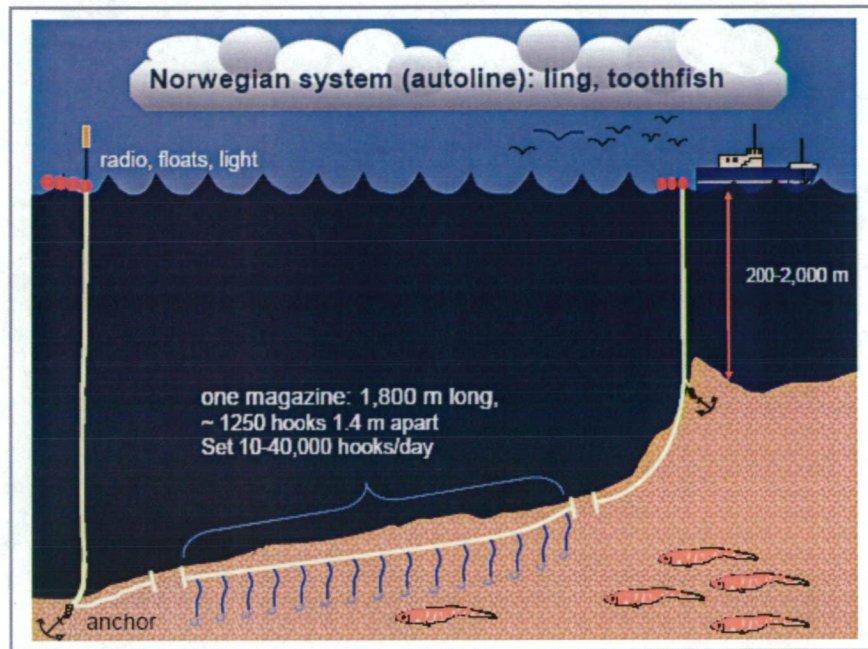


Figure 4.2: Indicative longlining configuration (Source: AFMA 2005e: 22)

4.3 CCAMLR-managed fisheries

4.3.1 Established fisheries

The Patagonian and Antarctic toothfish fisheries are managed by States that are party to the Convention on the Conservation of Antarctic Marine Living Resources in a single species context. Under CCAMLR conservation measures 21-01 (2002) and 21-02 (2002), fisheries are either *established* fisheries, *new* fisheries where specific information from an area has not been submitted to CCAMLR, or *exploratory* fisheries that continue to be considered as new fisheries until certain conditions have been met (see AFMA 2005e; CCAMLR 2004b; 2005c; Constable *et al.* 2000; Sabourenkov & Miller 2004).¹²⁶ These fisheries are carefully monitored so they develop gradually and only as sufficient scientific information is collected on which to assess the potential yield of each new fishery and the potential impacts of fishing effort on ecosystem

¹²⁶ CCAMLR members are also developing *Fishery Plans* to regulate all fisheries in the Convention Area, provide clear and uniform guidance on data and information requirements, and streamline annual review processes and assessments by the SC-CCAMLR (CCAMLR 2004b; 2005c).

components (Kimball 2004; Miller *et al.* 2004). The main toothfish fisheries are illustrated in Figure 4.3. Sixteen finfish fisheries and one krill fishery, including seven new and exploratory fisheries, were conducted during the 2004/05 fishing season (CCAMLR 2005d Paragraphs 1.10-1.14).

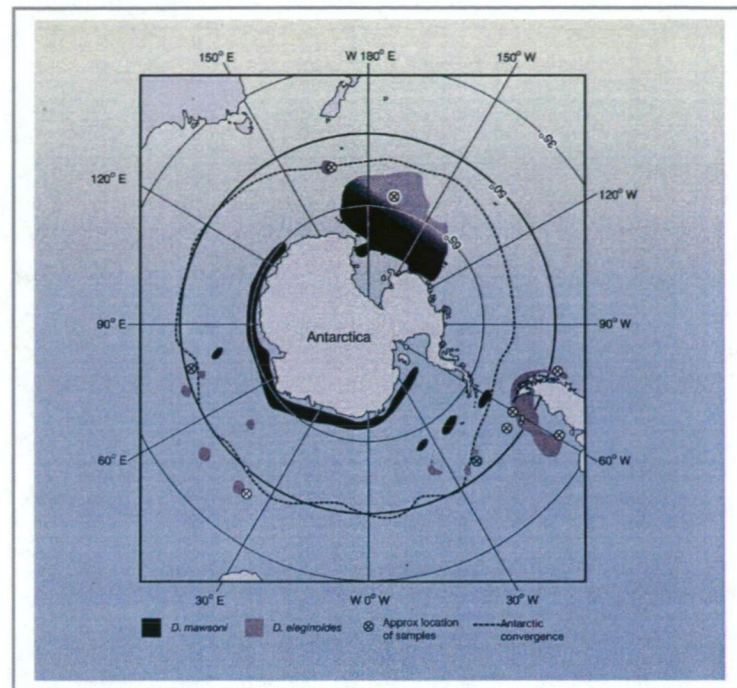


Figure 4.3: The main Patagonian and Antarctic toothfish fisheries (Source: Smith & Gaffney 2000: 17)

Sixteen CCAMLR members fished for finfish and the Contracting Party of Vanuatu fished for krill.¹²⁷ These included Patagonian and Antarctic toothfish fisheries in CCAMLR Sub-areas 48.3, 48.4, 48.6, 88.1 and 88.2 and Divisions 58.4.1, 58.4.2, 58.4.3a and 58.4.3b (CCAMLR 2005b, d) (Figure 1.5). Other Patagonian toothfish fisheries occurred in French national maritime waters off Kerguelén and Crozet Islands (CCAMLR Division 58.5.1 and Sub-area 58.6), South African national maritime waters off PEMI (CCAMLR Sub-areas 58.6 and 58.7), and Australian national maritime waters off HIMI (CCAMLR Division 58.5.2). Approximately 15 vessels fish legitimately for toothfish in the Convention Area (FMNH 2004).

4.3.2 New and exploratory fisheries

CCAMLR considers as *exploratory* any new toothfish fishery that has not had any previous fishing approved by CCAMLR members. Since 1996/97, CCAMLR has received an increasing number of applications from fishers to access exploratory longline fisheries in almost all of the CCAMLR statistical Sub-areas and Divisions, and to establish exploratory trawl fisheries in some statistical Sub-areas and Divisions close

¹²⁷ CCAMLR members fishing in the 2004/05 fishing season include Argentina, Australia, Chile, France, Japan, New Zealand, Norway, Poland, Republic of Korea, the Russian Federation, South Africa, Spain, Ukraine, the United Kingdom, the United States and Uruguay.

to the Antarctic continent in the Indian Ocean sector in each year (Gianni 2004b; Kock *et al.* in press; Sabourenkov & Miller 2004). However, according to the SC-CCAMLR, in most of these fisheries, the fishing effort has been low and the reported catches small (CCAMLR 2004f). In an effort to manage these fisheries, CCAMLR members have adopted CCAMLR Conservation Measure 41-01 (2004): *General measures for exploratory fisheries for Dissostichus spp. in the Convention Area in the 2004/05 season* (CCAMLR 2004b).

The Ross Sea toothfish fishery (exploratory fisheries in CCAMLR Sub-areas 88.1 and 88.2) is the southernmost high seas fishery in the world, and the extreme weather conditions make fishing difficult and dangerous (NCFA 2005) (Appendix D). Antarctic toothfish forms over 95 per cent of the catch in that region, and the harvest has steadily increased from about 40 metric tonnes in 1998 to over 2,500 metric tonnes in the 2003/04 fishing season (FMNH 2004).¹²⁸ For most of the year the Ross Sea is covered by ice. However, during January and February areas of open water allow fishers access to the continental shelf and slope.¹²⁹ In particular, New Zealand longliners have developed both new and exploratory fisheries in this region and four New Zealand-flagged vessels were granted access to CCAMLR Sub-area 88.1 in the 2004/05 season (Respondent 19). Longline vessels from South Africa, Uruguay and the United States have also accessed the fishery, and in the 2003/04 fishing season, 13 States with 32 vessels were permitted to fish the area (FMNH 2004).

There is no specific toothfish fishery under New Zealand's jurisdiction although small isolated catches have been reported in the southern areas of New Zealand's maritime zone and the Government plays a key role in the management of the Ross Sea toothfish fishery (Respondent 19). New Zealand fishers began commercially fishing for Patagonian toothfish in 1996/97, with the effort largely focused on the Ross Sea region, although the catch does not contribute significantly to the State's overall fishing output (Respondent 34).¹³⁰ The New Zealand Government uses a co-management model to manage the toothfish fisheries and complies with CCAMLR conservation measures.¹³¹ It implements domestic fisheries legislation to control its nationals within New Zealand's maritime waters and on the high seas (New Zealand 2005b).

¹²⁸ New Zealand longline fishers initially targeted toothfish in the Ross Sea in 1998 (AFMA 2005e). In CCAMLR Sub-area 88.1, 2,166 metric tonnes of toothfish were taken against a TAC of 3,250 metric tonnes in the 2003/04 fishing season. An additional 375 metric tonnes were taken by New Zealand longline fishers in an exploratory fishery in CCAMLR Sub-area 88.2.

¹²⁹ Although CCAMLR members set a TAC for the high-Antarctic toothfish fisheries, no effort is made to limit the number of fishing vessels in the fisheries. In a *race for the fish*, licensed fishers are permitted to enter the fisheries and fish until the TAC has been reached (see Hardin 1968; Molenaar 2003).

¹³⁰ New Zealand vessels have fished in CCAMLR Sub-areas 48.3 and 48.6.

¹³¹ Co-management is a multi-faceted collaborative and participatory process for managing natural resources that incorporates numerous stakeholders in a variety of roles (Borrini-Feyerabend 2000; Jentoft 2005). It is a democratic process that involves social justice and the equitable sharing of resource-related benefits and responsibilities. It also recognises uncertainty and change and multiple or different options.

Australian fishers have also accessed new and exploratory toothfish fisheries, that include those found in the high-Antarctic Prydz Bay region (CCAMLR Sub-areas 58.4.2 and 58.4.3), since 2003 (AFMA 2004a; CCAMLR 2004f). Other Australian high-Antarctic fisheries include Elan and BANZARE banks (CCAMLR Sub-area 58.4.3) and areas south of 60°S (CCAMLR Sub-area 58.4.2). They are managed in accordance with CCAMLR conservation measures and any applicable national legislation. In Australia, they have been informally managed by AFMA through annually developed permits in consultation with the AAD, other government departments and various management committees.

In an effort to reduce the number of applications to fish the new and exploratory fisheries, CCAMLR members introduced a cost recovery system in 2003 (CCAMLR 2004f).¹³² However, 13 CCAMLR members submitted 26 notifications for new and exploratory fisheries for toothfish in CCAMLR Sub-areas 48.6, 88.1, 88.2 and Divisions 58.4.1, 58.4.2, 58.4.3a and 58.4.3b for the 2004/05 fishing season. Given that the stock status in these areas (and particularly those in the Ross Sea region) is unknown, and the large numbers of notifications to fish these stocks, CCAMLR members acknowledge the urgent need to apply precaution and conduct comprehensive stock assessments before they are commercially exploited.

4.4 State-managed fisheries

4.4.1 Chilean fishery

The Patagonian toothfish fisheries are important to the Chilean fishing and export sectors (Catarci 2004).¹³³ Patagonian toothfish stocks around Chile are straddling or trans-boundary stocks that span Chilean and Argentinean maritime waters and the Convention Area (Respondents 31 and 37). This fishery is divided into a small-scale artisanal fishery and large-scale commercial fishery where fleets operate in different, but adjacent, areas off the Chilean coast (González *et al.* 2001) (Appendix D). Chile also declared the Presencial Sea in 1991 that extends Chile's maritime waters by 500 per cent into high seas areas (Kibel 2001). Physically, it is a triangulation between Chile, Easter Island and Antarctica. There, Chile acts in a dissident manner by exercising special rights (and power) over the marine resources found on the high seas adjacent to its maritime waters and has the right to take certain unilateral actions in respect of these interests, particularly with regard to straddling fish stocks.¹³⁴ Kibel (2001: 43) is highly critical of Chile's claim of a Presencial Sea because it "would in practice create chaos rather than stability in international law, and would result in the

¹³² A payment of US\$6,000 is required that consists of US\$2,250 administrative costs and US\$3,800 that can be refunded on commencement of fishing (Respondent 57).

¹³³ Commercial stocks are harvested by fishing companies such as Pesca Chile S.A. (that forms part of the Spanish Pescanova Group that harvests 43 per cent of Chile's industrial quota) (Appendix E).

¹³⁴ However, rights are not considered as a maritime jurisdictional *claim* in the same way as those pertaining to maritime waters under LOSC.

unravelling rather than the evolution of ocean governance.”

The Chilean artisanal Patagonian toothfish longline fishery is located outside the Convention Area and is found on the continental slope that extends five nautical miles from 18°S to 47°S where its southern border is defined by the fishing area reserved for the deep-sea industrial fishery (Under-Secretariat of Fisheries 1999). The fishery began in 1962, expanded significantly in the 1980s, and peaked in 1992 (see TRAFFIC 2003b). There is no limit on catches in this fishery although it is limited by the vessel size (18 metres overall length) and gear restrictions (only deep-sea longlines can be set with a limit of 12,000 hooks per cast). No user rights or property rights exist in this fishery, observers are not required, and it has been conducted under an open-access regime since its inception. In addition, over 300 vessels may operate in the fishery each year. These factors have made it impossible for the Chilean Government to set a TAC for this fishery because Chilean fisheries legislation “is not perfect from the conservation point of view” and social aspects related to this fishery have resulted in fishers opposing a quota (Respondent 53). Such unregulated management arrangements may predicate a crisis in that fishery. In this light, the Chilean artisanal Patagonian toothfish longline fishery is part of an unstable *Chilean Toothfish Sub-network* because it is accessed by fishers that do not align themselves with government policies, laws and regulations.

The Chilean commercial Patagonian toothfish longline fishery began in the late-1980s (Fallon & Kriwoken 2004). It currently extends off the continental slope from 47°S to 57°S, but also to high-seas areas including coastal waters off Argentinean Patagonia and the Falkland Islands, Southern Georgia and Kerguelén Island. Thirteen factory vessels and two freezer vessels access the fishery (using longlines with an average of 10,000 hooks per cast) for seven months per year in Chilean waters, from January to May and from September to December. For the rest of the year from April to August, fishers access other fisheries located in international waters (González *et al.* 2001).¹³⁵ A technical assessment of the state of the stock is conducted annually for the commercial fishery, an annual TAC is calculated and allocated among eligible fishing operators by public auction (Respondent 53). Harvesting rights, known as Extraordinary Fishing Permits (EFPs), are auctioned to successful bidders who gain a right to harvest a specified portion of the TAC annually for a ten-year period. EFPs are divisible, transferable once a year, and can be leased, lent freely or banked (González *et al.* 2001).

Two management systems and sets of regulations govern the Chilean Patagonian toothfish fishing industry although they apply to one fish stock. This situation leads to problems of economic efficiency and social inequity (Respondents 31 and 37; Shotton 2001). However, all Chilean fisheries, including the Patagonian toothfish fisheries, are

¹³⁵ At the height of longlining activities in the late-1990s, there were never more than 100 to 120 longline vessels in the toothfish fisheries (Respondent 53).

governed by Chilean environmental policy that promotes sustainable development to ensure the quality of life for current and future generations (APEC 2005). In addition, Chilean fisheries are regulated by the *General Law of Fisheries and Aquaculture, 1991* that aims to protect and preserve marine living resources, both commercial and recreational, which is conducted within, and adjacent to, national maritime waters (Government of Chile 1991). The Chilean *Law of the Environment, 1994* and associated regulations also establishes a framework for integrated environmental management that includes marine living resources to promote economic growth, social equity and environmental protection (Government of Chile 1994). As such, the various policies, laws and regulations established by the Chilean Government create an OPP to squeeze the debate, establish the problematisation, and enrol stakeholders in the *Chilean Toothfish Sub-network* (see Callon 1986; Kendell & Wickham 1998; Selman & Wragg 1999). Adding to these measures, the Chilean Government seeks to comply with CCAMLR conservation measures, adopted the CCAMLR CDS in 2000, and developed a *National Plan of Action* through its national actor-network to reduce incidental bycatch by 90 per cent over a three-year period starting from 2002/03 (Respondent 53). The Chilean Government also funds fisheries research (i.e. fish stock evaluation and monitoring of fisheries performance) through the Fisheries Research Fund and other Government resources (see Austral University of Chile 2001; Ecofish Consulting 1996) and has contributed to FAO Fisheries Technical Papers (see Shotton 2001).

4.4.2 Argentinean fishery

Little is known about the Argentinean Patagonian toothfish fishery. However, catch from the Argentine sector remains small, and in 2000, Patagonian toothfish landings made up approximately 0.8 per cent of the total national catch (Catarci 2004).¹³⁶ The largest concentrations of fish stocks are found in Argentine waters outside the Convention Area between 37°S and 40°S over the continental shelf and to the south off the Falkland Islands between 52°S to 55°S during winter (Schonberger & Agar 2001: 8). However, these stocks are widely distributed up to the Peruvian coast and across the Patagonian Shelf edge and slope in depths of 80 to 500 metres, between 40°S and 55°S, and they form part of a larger straddling or trans-boundary population that is conditioned by the Falkland Islands Current (FAO 1983; FIFD 1999; TRAFFIC 2003b) (Appendix D). Fishers use bottom trawling and longlining in this fishery although this species is predominantly caught as a bycatch species that represents 60 per cent of total declared catches (TRAFFIC 2003b). Juveniles are also often harvested on the continental shelf and upper slope because their pelagic nature and the quantity of food available to them in these areas make them easy to target. In contrast, mature fish in the region are more difficult to harvest because they inhabit deeper waters and are benthic feeders capable of undertaking feeding migrations in pelagic waters (SAGPyA 2004).

¹³⁶ Large industrial fishing companies such as Argenova S.A. (part of the Spanish Pescanova Group) and ASC South America S.A. deploy bottom trawls and longlines (Catarci 2004) (Appendix E).

The events that encouraged fishers to target Argentinean Patagonian toothfish stocks are similar to the events that influenced fishers to do the same elsewhere. Argentine fishers and the Argentine Government fisheries focused on maximising production and exports under an open-access system. During the 1970s, growth in the Argentine fisheries sector was encouraged by increasing international seafood prices (caused, in part, by reduced catches in the over-exploited North Atlantic fishing grounds), the opening of foreign markets and declining international prices for fishing vessels (Schonberger & Agar 2001: 5). In 1991, the Argentine Government instituted an unsuccessful generalised limited entry regime, *Decree No. 2236*, under which only Argentinean-flagged vessels could gain access to national fishery resources (Schonberger and Agar 2001: 20). In spite of the economic hardship, the limited entry regime and then catch limits over the following years, effort and catches continued expanding. Legal challenges, which allowed the transfer of fishing licenses (many of them without any catch limitations) from old and less efficient to newer and more efficient vessels, coupled with a weak national monitoring and enforcement structure, also resulted in an increased fishing effort. Over-capitalisation resulted in fishers investing in equipment and technology, competing against each other for fish, and over-fishing fish stocks (see Di Paola & Machain 2004; Flewwelling *et al.* 2003; Schonberger & Agar 2001).

As fish stocks became depleted, Argentine fishers sought an alternative source of income and targeted the Patagonian toothfish in the early-1990s. However, these stocks also became heavily affected and the longline fleet decreased from 20 to seven vessels in 1997 (TRAFFIC 2003b; UN 2002b). The Argentine Government then introduced a series of area closures and fishing bans to avert the collapse of the Patagonian toothfish fishery. In addition, the Government developed a new institutional and legal framework in 1998 under *Federal Fisheries Law No. 24,922* to squeeze the debate through its own market orientated OPP that is based on a Quota Management System (QMS), individual transferable quotas (ITQs) and MSY (see Davidse *et al.* 1999; Di Paola & Machain 2004; Flewwelling *et al.* 2003). However, the law makes no specific mention of the precautionary principle,¹³⁷ Patagonian toothfish catches have generally exceeded the MSY in recent years (BOI 2005; UN 2002b), and up to 25 per cent of the annual catch is possibly not recorded or counted against MSY levels (TRAFFIC 2003b).

The Ministerio de Economía, Secretaría de Agricultura, Ganadería Pesca y Alimentación (SAGPyA) is responsible for managing Argentinean Patagonian toothfish stocks including those found on the high seas, implementing CCAMLR conservation measures and overseeing Argentine research projects related to Antarctica (Respondent 48; SAGPyA 2006).¹³⁸ However, the measures introduced by SAGPyA have failed to stop over-exploitation of Patagonian toothfish stocks, and political forces in Argentina have “limited institutional capacity to carry out the Government’s resource management

¹³⁷ Resolutions relating to the Argentine Hake (*Merluccius hubbsi*) do refer to the precautionary principle.

¹³⁸ The Argentine Government adopted the CCAMLR CDS in 2000.

mandate” or “carry out basic management functions” (Schonberger & Agar 2001: 35 and 24). The shift from a traditional fisheries management regime of increasing harvesting and exports to one which applies TACs to ensure long-term sustainability has engendered significant mistrust between stakeholders in the fishing sector. As a result, the new institutional and legal framework and limited entry regime to control fishing effort in the Patagonian toothfish fishery has been ineffective (TRAFFIC 2003b) due to the lack of political will, credibility in the eyes of the fishing industry and concerns that employment opportunities will be lost (Flewwelling *et al.* 2003). Adding to these difficulties, the Argentine Government has continued to experience problems associated with its overlapping jurisdictions with Chile, Uruguay, the Falkland Islands and South Georgia. Instability in the *Argentinean Toothfish Sub-network* is also caused by fishers over-fishing the stock and being unable or unwilling to comply with government policies, laws and regulations that seek to manage the fishery in a manner considered more sustainable.

4.4.3 Tensions between actor-networks in the Southern Cone area

The Southern Cone consists of Argentina, Brazil, Chile, Paraguay and Uruguay. With the creation of the Mercado Común del Sur/Southern Common Market (Mercosur), these States formalised an actor-network to support regional cooperation and integration in the context of global competition (see SIT Studies Abroad 2004). However, the region experiences political, economic and social instability and, as a part of this economic integration process, they have needed to address issues of sovereignty and territorial control in relation to Southern Ocean affairs (including fisheries). As such, they have sought to make the regional *Mercosur Sub-network* and their national sub-networks more predictable and stable. A number of these instabilities are detailed below.

The Beagle Channel

The Beagle Channel is one of the three seaways that separates Tierra del Fuego in Chile from Ushuaia in the Argentine Tierra del Fuego (along with the Magellan Strait and Drake Passage) (Greenberg *et al.* 2000). When the Convention on the Conservation of Antarctic Marine Living Resources was negotiated, Argentina and Chile were in a territorial dispute over the channel. Three small islands, known as the Picton, Nueva and Lennox Islands, had been in Chilean sovereign control for over 100 years. However, they came into dispute in 1978 when the possible extension of sovereign maritime zones to 200 nautical miles was developed (Johanson 1997). At the time, if the extension were applied to those islands, Chile’s maritime zone would have been extended well into the Atlantic Ocean, interfering with Argentina’s access to Antarctica. Different interpretations over boundary lines and ownership rights were in dispute, and the issue was resolved through mediation instigated by the Vatican, the moral authority of Pope John Paul II and support by the United States Government. The Vatican’s moral

persuasion influenced Chile and Argentina to acknowledge that both States would suffer from a territorial war. They entered into the Declaration of Peace and Friendship in 1984 that was signed in Ushuaia, Argentina in 1999 (see Greenberg *et al.* 2000; McDonald 1988; United States 1999).

Uruguay and the Argentinean-Uruguayan Common Fishing Zone (CFZ)

Straddling or trans-boundary Patagonian toothfish stocks are found in the Argentinean-Uruguayan Common Fishing Zone (CFZ) located to 200 nautical miles from the baseline and outside the Convention Area in the south-western Atlantic Ocean (see CONICET 2005; INAPE 1999) (Appendix D). The CFZ was created in 1973 by the Argentine and Uruguay Governments. Fisheries management in the CFZ is administered by the Comisión Técnica Mixta del Frente Marítimo (CTMFM) and only vessels flagged to these States are permitted to fish in the area. In addition, SAGPyA administers the Argentinean Patagonian toothfish fishery and the Dirección Nacional de Recursos Acuáticos (DINARA) administers the Uruguayan artisanal Patagonian toothfish fishery (see DINARA 2005).

There is very little publicly available information about the Uruguayan Patagonian toothfish fishery. Nonetheless, the Uruguayan trawl fleet has harvested small quantities of juvenile Patagonian toothfish as bycatch, although the stocks have not been considered large enough to support a commercial artisanal fishery (TRAFFIC 2003b). In addition, after joining the Convention on the Conservation of Antarctic Marine Living Resources, Uruguay's interest in the CCAMLR-managed fisheries increased and a mixed pattern of Uruguayan and foreign ownership of the toothfish fishing fleet increased. Foreign companies subsequently used the port of Montevideo to unload and trans-ship toothfish catches. Licensed Uruguayan fishers began fishing around South Georgia and Shag Rocks in 1998 (CCAMLR Sub-area 48.3), although the catch from that sector remains small and comprises just over one per cent of total landings in 2000 (Respondent 47). To manage toothfish fishing in the Convention Area, the Uruguayan Government has established a special Commission known as La Comisión Interministerial CCRVMA Uruguay, and seeks to comply with certain CCAMLR conservation measures.¹³⁹ Other groups have also formed their own actor-networks to promote the Uruguayan fishing industry. Uruguayan fishers are represented by a workers' union known as the Sindicato Único Nacional de Trabajadores del Mar y Ramas Afines (SUNTMA) and the union of Uruguayan fishing masters known as the Sindicato Único de Patrones Pesqueros del Uruguay (SUDEPPU) (Respondent 47). These groups remain disparate, have no single address or Internet website, and are difficult to identify or mobilise in the *Uruguayan Toothfish Sub-network*.

¹³⁹ La Comisión Interministerial CCRVMA Uruguay includes representatives from DINARA, the Ministry of Foreign Affairs and the Defense Ministry (Respondent 47). Officials from the Comisión Interministerial represent the Uruguayan Government at CCAMLR meetings.

According to DINARA, Uruguayan fisheries administrators allocate market orientated ITQs in accordance with MSY principles under the 1969 *Law 13.833, Riquezas del Mar* (Bertullo 2000). Principally, the Uruguayan Government is focused on indirect methods of controlling fishing effort that focuses on licence control and the assumption that this mechanism provides an effective way of ensuring the conservation of the fish stocks. It also closes fishing seasons and areas, and enforces mesh regulations and minimum fish-size landings. However, DINARA remains critical of these controls because they imply increased surveillance and compliance costs to meet complicated regulations and stringent inspection requirements.¹⁴⁰ For Bertullo (2000), management of the Patagonian toothfish fishery has also been problematic for DINARA. This is because DINARA has yet to identify how ITQs are considered as property since in Uruguay a property right means the absolute liberty to dispose of this right and the concept of an ITQ, meaning the *privilege to catch*, has no legal basis. Fish resources legally belong to the Government and fishers only acquire the property when the catch is taken on board, after which, they have the *right* to sell, rent, donate, or discard the catch regardless of any conservation priority. This discussion highlights the disparate, leaky and unstable character of the *Uruguayan Toothfish Sub-network* where stakeholders seek to protect their own interests. In addition, this actor-network is only partially *punctuated* into a single node in the *CCAMLR Sub-network*. As such, the Uruguayan Government provides an excellent example on how national governments can take a bifocal approach to managing Patagonian toothfish stocks, where they principally protect national interests but also connect with the *CCAMLR Sub-network* to gain access to CCAMLR fisheries.

The Valdivia Group

Following consultation at international fora such as the ATCM, Argentina, Chile and Uruguay agreed to form a new regional actor-network in 1995 with Australia, New Zealand and South Africa, known as the Group of Temperate Southern Hemispheric Countries on Environment (the Valdivia Group).¹⁴¹ They pledged themselves to enhance Southern Hemisphere environmental interests through ongoing multilateral negotiations, and to facilitate scientific and technical cooperation and collaboration on common areas of environmental concern (Australia 1996; Dodds 1998).

The Valdivia Group was initially concerned with biodiversity, climatic change, ozone depletion, forestry and desertification. Later, the Valdivia Group's focus extended to managing and protecting the Southern Ocean environment and resources, and raising concern about the increase in illegal fishing activities on Patagonian toothfish stocks in

¹⁴⁰ For Bertullo (2000) the use of TACs as they apply to Uruguayan fisheries may not be an adequate tool for regulating Patagonian toothfish stocks because it provides incentives for increased competition between fishers that manifests itself in a *race to fish* (as described by Hardin 1968) where individual fishing vessels seek to maximise their share of the available fish stocks (see also Molenaar 2003).

¹⁴¹ Argentina and Brazil are also members of the Valdivia Group (Australia 1998e; New Zealand 2005b).

the region. A statement presented by the Valdivia Group at the sixteenth CCAMLR meeting in 1997 stated that its members strongly supported “the development by CCAMLR of timely and effective measures to prevent illegal fishing, and duly maintain the objective of long-term conservation and sustainable use of Antarctic marine living resources” (see Prior pers. comm. 1998 in Dodds 1998: 738). However, management, conservation and protection of the Patagonian toothfish raised tensions within the Valdivia Group as members sought to promote their national interests. In addition, it is difficult to assess how active, influential, connected or stable the *Valdivia Group Sub-network* is, or has been, because I was unable to source documentation detailing this Group’s achievements. Nonetheless, the Valdivia Group is directly accredited in the ACAP preamble (ACAP 2001).¹⁴²

Falkland Islands/Islas Malvinas disputed territory

The United Kingdom exerts sovereign control over the Falkland Islands. However, Argentina maintains that a dispute exists between the United Kingdom and Argentina with regard to sovereignty over the territory and it remains unresolved in international law.¹⁴³ The dispute is based on historical events that largely began after the French, as the first recorded occupants of the Falkland Islands, established a settlement at Saint Malo (now Port Louis) in 1764 (see Hilkens 2000; Johanson 1997).¹⁴⁴ A British expedition then claimed the islands as sovereign territory in 1766 after violently clashing with the French. In 1833, a British naval garrison occupied the Islands and in 1843, after a period of military rule, the garrison was organised as a British colony. Spain objected to both the French and British occupation. However, as Spain and France were allies, the French Government sold Port Louis to Spain in 1767. From that time, and given the strategic location of the Falkland Islands in relation to the passages between the South Atlantic and Pacific Oceans, Spain and the United Kingdom have violently disputed the territory. Each State has claimed total sovereignty, demanded the other relinquish its claim, and been left with complete occupancy and control of the Falkland Islands for varying periods (see also Chenette 1987).

It is against such a backdrop that Argentina has repeatedly made counterclaims to the sovereignty of this territory, which they named the Islas Malvinas, dating back to the Spanish title of 1764/66, which Argentina inherited after it declared independence from

¹⁴² Australia, New Zealand, Ecuador, Spain and the Republic of South Africa ratified ACAP in February 2004 (see AAD 2004g). ACAP (2001: 1) states the following: “APPRECIATING the work of the Group of Temperate Southern Hemisphere Countries on the Environment (known as the Valdivia Group) in considering the need to address the threats posed to Southern Hemisphere albatross populations, and the work of Australia in taking forward this need in the context of the Convention.”

¹⁴³ Argentina maintains that Américo Vespucio discovered the Falkland Islands in 1502, Magellan in 1520 and Camargo in 1540 and, therefore, bases its territorial claim on these ancient Spanish discoveries and Spanish titles (such as the Treaty of Tordesillas of 1494) that assert the right of first discovery (see Hilkens 2000). The British counterclaim that the islands were first discovered by John Davis in 1592.

¹⁴⁴ Hence the Argentinean name of Malouines = Malvinas.

Spain in 1816 (Chenette 1987; Johanson 1997).¹⁴⁵ In particular, Argentina maintains that the British have illegally occupied the Falkland Islands since 1833. Most recently, the United Kingdom and Argentina went to war over the Falkland Islands on 2 April 1982, five days before the Convention on the Conservation of Antarctic Marine Living Resources entered into force.¹⁴⁶ Restoration of diplomatic relations resulted in the issue of a joint statement on the disputed sovereignty during 1989 and 1990 (Freestone 1991). This enabled negotiations on fisheries conservation between the two States that culminated in the United Kingdom/Argentina Joint Statement on the Conservation of Fisheries around the Falkland Islands/Islas Malvinas, where both parties reiterated their position on sovereignty (UK/Argentina 1990; 1995). Following the 1982 conflict, the United Kingdom imposed a 150-mile EEZ around the Falkland Islands that resulted in the displacement of Argentine fishers from the area. Despite this act, British authorities remain reluctant to apprehend Argentine fishing vessels in these waters and the Argentine Government continues to protest the United Kingdom's licensing system for this fishery. Due to ongoing sovereignty conflicts there is little dialogue between the Argentine and British Governments about jointly managing Patagonian toothfish stocks in the region (McLauren L'Hommedieu 2002; Respondent 2).

4.4.4 British external territorial fisheries

Falkland Islands fishery

In 1985, the Falkland Islands administration was split from South Georgia, South Sandwich and South Shetland Islands (SGSSI) administration, although international relations with regard to all these islands remain the responsibility of the British Government (Falkland Islands Government 2005a, b).¹⁴⁷ As such, the Falkland Islands Government manages the Falkland Islands Patagonian toothfish fishery and the SGSSI Government manages the SGSSI Patagonian toothfish fishery. In addition, the Falkland Islands Patagonian toothfish fishery is located outside the Convention Area. Therefore, it has a different international management context to the SGSSI Patagonian toothfish fishery, which is located inside the Convention Area.

The Falkland Islands Patagonian toothfish fishery began in the late-1980s as a longline fishery, and fishers from the Falkland Islands have access to stocks found in these waters and in the SGSSI fishery.¹⁴⁸ Given that the Falkland Islands are located outside the Convention Area and form part of the Patagonian Shelf, any dispute over the

¹⁴⁵ In 1816 the newly formed United Provinces of Rio de la Plata, forerunner of present day Argentina, declared independence from Spain (see Hilken 2000; Johanson 1997). The new government declared its sovereignty over the Falkland Islands by right of succession from Spain.

¹⁴⁶ The British forced the Argentineans to surrender on 14 June 1982 (see Chenette 1987).

¹⁴⁷ International relations with regard to the Governments of the Falkland Islands and SGSSI, as an overseas territories of the United Kingdom, are the responsibility of the British Government and are dealt with through the Foreign and Commonwealth Office, United Kingdom.

¹⁴⁸ Patagonian toothfish comprises approximately one per cent of the Falkland Island's gross domestic product and is entirely exported (Catarci 2004).

sovereignty of these Islands is directly between the British and Argentine Governments. The British Government declared a 150-mile Falkland Islands Inner Conservation and Management Zone (FICZ) in 1987, adjacent to the Argentine maritime zone, to protect squid and fish stocks against over-fishing (see Bethlehem 2002; Kwiatowska 1994; McLauren L'Hommedieu 2002) (Appendix D). In a joint statement in 1990, the British and Argentine Governments declared a new zone called the Falkland Islands Outer Conservation Zone (FOCZ), and it extended beyond the FICZ to the north, east and south of the Falkland Islands to 200 nautical miles. The agreement granted the Falkland Islands Government the right to administer and regulate fisheries in the FOCZ, but Argentina was also entitled to manage its own vessels in the zone (Bethlehem 2002; McLauren L'Hommedieu 2002).

The FOCZ sits partly over the middle of the shelf break, so there is the possibility that Argentineans (or others) will harvest toothfish along approximately 20 to 30 per cent of the outer edge of the zone. This situation causes tension because the British Government considers the catch as Falkland Islands fish (Respondent 2). To the north of the FOCZ there is also a central area more than 200 nautical miles from land, where the Argentine maritime zone does not extend up to the edge of the continental shelf. Unofficially known as a 'Doughnut Hole', it is located in the 46°S to 48°S, 59°W region, and is beyond the sovereign jurisdiction of both States (Respondent 2). Here, Argentineans fish for squid, hake, hoki and the Patagonian toothfish. However, toothfish stocks located in the area *probably* form part of the FOCZ stock. As a result of these uncertainties, enrolment in the *Falkland Islands Toothfish Sub-network* is precarious and the actor-network remains unstable (see Law 1999a). In addition, the position of the Patagonian toothfish in the network is cast into doubt because it dissidently straddles the FOCZ, and the Falkland Islands administration needs to actively maintain links with non-Falkland Islands fishers that do not necessarily recognise the authority of the British Government or Falkland Islands administration or their policies, laws and regulations to manage the fishery.

Despite these uncertainties, Respondent 2 considered that the current level of catch in the FOCZ "is about right at about 2,000 to 1,500 mt" and that it is "very difficult to say if Argentinean fishing impacts the Falkland Islands toothfish stock." In addition, difficulties arise when calculating the extent of Patagonian toothfish stocks across the Patagonian Shelf given that they continue north of the FOCZ into Argentine and Uruguayan maritime waters (Respondent 47).¹⁴⁹ Nor is there information to confirm whether transient stocks enter these waters. However, Respondent 2 suspects that Patagonian toothfish found in Falkland Island waters "is practically a Falkland stock ... and ... that there is not much mixing with the Argentine stock ... although there is

¹⁴⁹ According to Arkhipkin (2004: no page), "toothfish juveniles migrate from their spawning and nursery grounds around the Burdwood Bank and North Scotia Ridge to shallow waters of the Patagonian Shelf, where they are caught as bycatch during the finfish fishery." Adult toothfish migrate into deep waters of the Argentine basin, where they are targeted by specialised longliners.

genetic interchange between the two stocks.”¹⁵⁰ For him, this species does not tend to migrate. However, given that genetic interchange occurs between the stocks and migration may occur between stocks, the Argentinean and Falkland Island Governments cannot be certain that they can manage their stocks alone. What can be said is that the Patagonian toothfish is the most valuable and highly priced marine resource in the Falkland Islands maritime waters, it was initially taken as a bycatch in the trawl fishery for icefish, and only two Falkland-Islands-flagged longliners are currently licensed to fish in these waters (Arkhipkin 2004) (Appendix E).

South Georgia and South Sandwich Islands fishery (SGSSI)

The SGSSI is located inside the Convention Area (CCAMLR Sub-areas 48.3 and 48.4), and across the associated plateau to the west around Shag Rocks along the Scotia Arc (Appendix D). These waters are different both oceanographically and biogeographically to the Falkland Islands and the high seas lie in between (Respondent 2). In these waters the Patagonian toothfish longline fisheries are controlled by the Government of SGSSI and legally binding CCAMLR conservation measures. The Government of SGSSI was formed in 1985 as a separate British territory under a commissioner after being previously part of the Falkland Islands Dependencies (Project Atlantis 2003). There is no permanent population on these islands, and fishers operate foreign-flagged vessels or are connected with the Falkland Islands.¹⁵¹ Between 1969 and 1997, 58 per cent of all finfish catch in Antarctic waters reported to CCAMLR members took place around South Georgia (Agnew 2004b). The Patagonian toothfish fishery around South Georgia initially began in the 1970s as a bycatch species from bottom trawl fishing but has since developed into a longline fishery. Commercial longline harvesting commenced in 1996/97. Since 2001 an individual quota system was introduced whereby the Government of SGSSI allocates the TAC between individual vessels (Agnew 2004a).

In 1993 the United Kingdom proclaimed both a 200 nautical mile maritime and conservation zone around the SGSSI, known as the South Georgia and South Sandwich Islands Maritime Zone (SGSSIMZ), and an ordinance for managing the fishery that provided, *inter alia*, for the collection of licence fees from fishers (Agnew 2004b; Dodds 2000). As part of these arrangements, the British and SGSSI governments imposed rigorous regulations upon the Patagonian toothfish fishery.¹⁵² A consulting

¹⁵⁰ Significant genetic DNA differentiation occurs between Argentine and Falkland Islands toothfish stocks (Appleyard *et al.* 2002; Smith and McVeagh 2000). Some toothfish migrate across the Patagonian Shelf to Chile and Uruguay. Spawning also occurs south of the FOCZ, where spawning moves north and moves onto the Patagonian Shelf, and in Argentina waters (Respondent 2).

¹⁵¹ In 2003 fishing vessels were registered in the United Kingdom, Falkland Islands, St Helena, New Zealand, South Africa, Spain, Japan, Korea, Chile, Uruguay and Russia and up to a dozen vessels fish in the fishery during the winter period (Brock 2003a; Project Atlantis 2003).

¹⁵² Measures include limited fishing season, strict licensing allocation parameters, pre- and post-fishing inspections, strict bycatch rules, move-on provisions, commitment to enforcement both within the fishing season and during the off-season as part of the *International MCS Network*, logbook accountability, and compulsory contributions to data collection and fisheries research (Respondent 39).

firm comprising government officials, scientists and resource managers who are based in the United Kingdom, the Marine Resources Assessment Group (MRAG Ltd), also conducts resource assessment and ecosystem-based research and recommends management action (see *MercoPress.com*. 2004b; MRAG 2004).¹⁵³ Based on MRAG advice, a range of conservation measures have been introduced to deter illegal fishers who have targeted these waters since the early-1990s (CCAMLR XIV 1995 Annex 5 SCOI Report). Some of the illegal fishers in these waters were purportedly crewing/using Argentinean-flagged vessels (Pearce 1996).

Although the SGSSIMZ was rejected by Argentina, surprisingly, there was no immediate reaction to these potentially provocative proclamations by the Argentine Government. A joint statement was signed by the British and Argentine Governments in 1995 (during the negotiations of the UN Fish Stocks Agreement) whereby both agreed to cooperate within the spirit of CCAMLR but reiterated their positions regarding sovereignty over the Falkland Islands and SGSSI (UK/Argentina 1995). In addition, the proclamations were effective in managing and conserving Patagonian toothfish in these waters and illegal fishers left the area in search of other and less policed waters. With these issues in mind, the *SGSSI Toothfish Sub-network* is relatively stable because the British and SGSSI governments have been more successful in associating themselves with other regional actor-networks, the *CCAMLR Sub-network* and a diverse range of actors.

4.4.5 South African external territorial fishery

A small Patagonian toothfish pot and longline fishery is located in South Africa's maritime waters around PEMI inside the Convention Area. The fishery is controlled by the South African Government and legally binding CCAMLR conservation measures. In 1996, the South African Government declared an experimental Patagonian toothfish fishery, set a TAC for the 1996/97 fishing season at 2,500 metric tonnes and issued five permits (under the *Sea Fisheries Act, No 12 of 1988*) for fishers to access the fishery (see South Africa 1996; 2005). Long-term fishing rights are allocated to ensure the continued presence of South African vessels in the fishery, to encourage investment and jobs, and to support the environmental sustainability of the fishery.

However, fishers over-exploited Patagonian toothfish stocks between 1996 and 1998 and it is estimated that catch worth over US\$100 million was illegally fished from the waters (FAO 2001b; Greenpeace 2000d; Hutchinson 2004; South Africa 2005). By 1998, the fishery was no longer commercially viable because stocks had been so severely depleted (Duncan 2002; Hutchinson 2004) and the fishery is likely to be less than 10 per cent of its initial size and expected to remain economically marginal (FAO 2001b; Kock *et al.* in press). Following the promulgation of the South African *Marine*

¹⁵³ MRAG promotes sustainable use through integrated management policies and practices, and works with worked with national governments, international agencies, industry and NGOs (MRAG 2004).

Living Resources Act, No 18 of 1998 (which replaced the *Sea Fisheries Act, No 12 of 1988*) the fishery has been regulated an experimental fishery (South Africa 1998). Only South African-flagged vessels are permitted to fish, and commercial rights have never been allocated (Respondent 18). After the steady decline of stocks, a TAC was set at 450 metric tonnes for the 2004/05 fishing season and the five permit holders consolidated costs and effort, reducing the number of longline vessels in the fishery from three to two (CCAMLR 2005f; South Africa 2005: 4-5).¹⁵⁴ The South African Government has committed itself to introducing an ecosystem approach to fisheries (EAF) management by 2010, one which includes the toothfish fishery and incorporates ecosystem-based management and sustainability objectives (South Africa 2004). In this light, although the South African Government has recognised the urgent need to manage the PEMI fishery in a sustainable manner and has accepted the OPP established by the Convention on the Conservation of Antarctic Marine Living Resources in relation to ecosystem management and precautionary decision-making, the actions of illegal fishers has made the fishery and the *South African Toothfish Sub-network* unstable and precarious.

4.4.6 French external territorial fisheries

The Administrateur based on La Réunion Island from the Territoire des Terres Australes et Antarctiques Françaises (TAAF), manages the La Réunion Island commercial Patagonian toothfish fishery that comprises two major fishing grounds inside the Convention Area around the Kerguelén and Crozet Islands (Respondent 58) (Appendix D).¹⁵⁵ Trans-boundary toothfish stocks in this region form part of a larger *shared* stock that moves across the Kerguelén Plateau between the Kerguelén Islands and Australian HIMI and possibly extends as far as the Crozet Islands (Smith and McVeagh 2000).

France is a member of the EU and, therefore, for fishing activities in EU waters, French authorities implement the 1983 CFP, under *Regulation (EC) No. 2371/2002*. However, the TAAF, including the Kerguelén and Crozet Islands, is not covered by the CFP. Sea fishing and the exploitation of marine products in these waters are regulated by *Law No. 66-400 of 18 June 1966 on the Exercise of Maritime Fisheries and the Exploitation of Marine Products in French Territory in the Southern Hemisphere and Antarctic* as amended by *Law No 97-1051 of November 18 1997 of Orientation on Maritime Fishing and the Marine Cultures*, and *Decree No. 96-252 of 27 March 1996* (Jeon 2004; Ministère de L'Agriculture et de la Pêche a, b). Specifically, *Law No. 97-1051* relates to the TAAF fisheries and creates an OPP to squeeze the debate because it aims to protect

¹⁵⁴ The South African Government has also made it mandatory for vessels to install a VMS, use seabird bycatch mitigation gear and carry scientific observers (FAO 2001e; Respondent 18). In 2005, the SC-CCAMLR recommended that the prohibition of directed fishing remain in force (CCAMLR 2005d).

¹⁵⁵ TAAF has managed the French overseas territory since 1955 that includes the Kerguelén, Crozet, Amsterdam and St-Paul Islands, and Terre Adélie (Antarctica) (see *DiscoverFrance.com* 2005; TAAF 2004). Kerguelén Islands have been used since 1949 and are populated by 50 to 100 people (Wikipedia 2005b). The Crozet Islands have been a National Park since 1938 to protect unique flora and fauna.

better the local Patagonian toothfish resources; recognise “the paramount role of the marine cultures for the economy and the use of the littoral areas and affirm[s] their agricultural character” and considerable commercial value; and reinforce sanctions against illegal fishing activities (Ministère de L’Agriculture et de la Pêche 2005a: no page). These instruments lay down rules for resource management, and more particularly, the allocation of TAC quotas and the technical requirements governing these fisheries. The regulatory system also adheres to CCAMLR conservation measures although France actively protects its national interests and has recorded reservations under the *Chairman’s Statement* (Section 3.4.4).

Fish harvested around the Kerguelén and Crozet Islands are exported to La Réunion Island and France, and only French-flagged vessels are permitted to fish in the TAAF (UN 1978). In particular, Article 2 of *Law No. 66-400 of 18 June 1966* states that: “no one may fish and hunt marine animals, or engage in the exploitation of marine products ... from vessels, without having first obtained authorization” (ITLOS 2000a: no page). Any vessel entering the TAAF is obliged to give notification of its presence and declare the tonnage of fish held onboard. A TAC of approximately 6,050 metric tonnes/year applies to the fisheries, and six longline fishing operators hold licences to access the stocks (Appendix E). The quotas include a 20 per cent Crozet Islands TAC component and an 80 per cent Kerguelén Islands TAC component. Overall, it is difficult to assess the stability of the *French Toothfish Sub-network* because the French Government maintains tight control over the fisheries and is secretive about its activities.

4.4.7 Australian external territorial fisheries

Macquarie Island fishery

Two closed access Patagonian toothfish fisheries are located in Australia’s maritime waters. The small Macquarie Island fishery started in 1994 as a trawl fishery (AAD 2001a; AFMA 2005f). It lies inside Australia’s maritime waters but outside the Convention Area, and is managed as an Australian fishery in accordance with the *Australian Fisheries Management Act 1991* (Australia 1991) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Australia 1999a) (Appendix D). In addition, the fishery is included in the South-East Regional assessment process although it is not specifically referred to in the *South-East Regional Marine Plan* (see Australia 2004c). However, Respondent 55 suggests that the fishery is managed in a complementary or comparative way to other toothfish fisheries found inside the Convention Area.¹⁵⁶ It operates under a limited entry management policy where one vessel is permitted to harvest a predetermined catch limit (AFMA 2003b, c).

¹⁵⁶ CCAMLR Resolution 10/XII calls on members to ensure that their flag vessels harvesting Patagonian toothfish stocks do so responsibly. Therefore, although Australia is not required to apply CCAMLR conservation measures to fishing around Macquarie Island because it lies outside the Convention Area, management measures must not undermine those applied by CCAMLR members (AFMA 2005f).

AFMA fishery managers have developed a formal strategic assessment report and management plan for the Macquarie Island fishery that is based on precaution and seeks consistency in this fishery with other international agreements including CCAMLR and LOSC (see Abetz 2006; AFMA 2005f, g). In particular, Australia has, on occasion, surpassed the principles set by CCAMLR members (see AFMA 2005e; Tuck *et al.* 2003). For this fishery, there are no explicit or formal links to CCAMLR processes.

Heard Island and McDonald Islands fishery (HIMI)

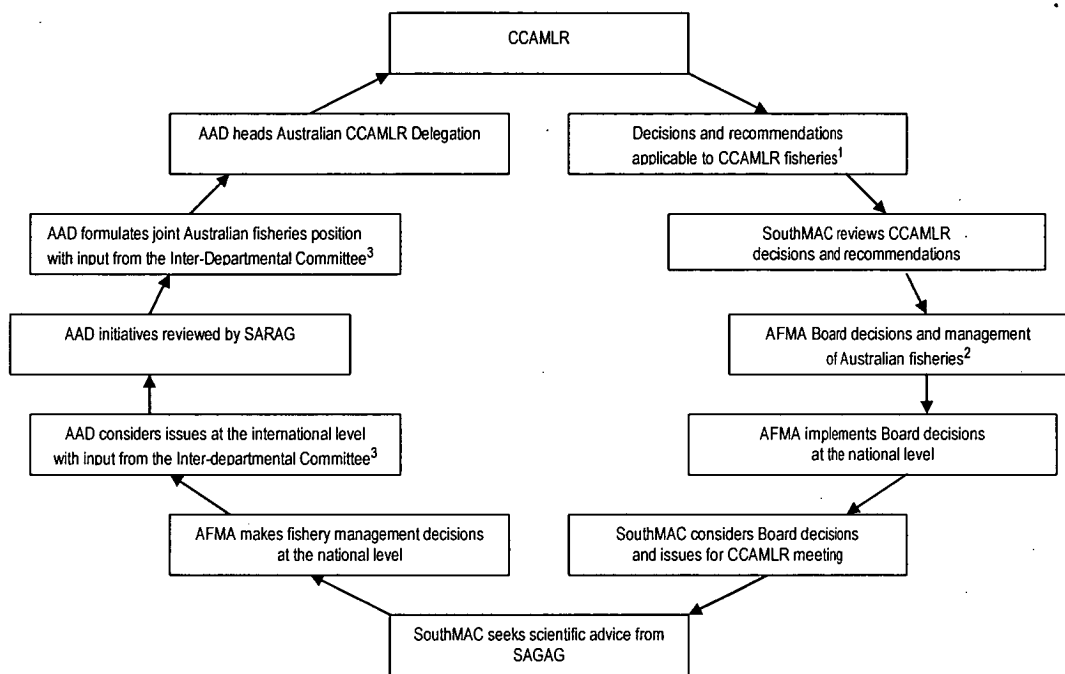
The second Patagonian toothfish fishery under Australian jurisdiction is the commercially modest HIMI fishery that started as a trawl fishery in 1997 (AAD 2001a), with a production value of approximately US\$22.7 million per year (Respondent 12). The fishery is conducted inside the HIMI Australian Fishing Zone (AFZ) and Convention Area, and it is now moving into a multi-gear fishery with the advent of longlining being extensively and successfully trialled since 2003, and potting that will be trialled in the 2005/06 fishing season (Appendix D). AFMA manages the fishery in accordance with the *Management Arrangements for the Heard Island and McDonald Islands Fishery 2002/2003*, *Australian Fisheries Management Act 1991*, the EPBC Act, *Antarctic Marine Living Resources Conservation Act 1981* (AMLR Act) (AFMA 2003a, b; Australia 1981; 1991; 1999) and CCAMLR conservation measures.

The Macquarie Island and HIMI fisheries are managed in accordance with all relevant international and regional management regimes to which Australia is party, and with due observation of *Australia's Oceans Policy* (Australia 1998b). Released in 1998, this policy recognises the need to understand and protect biodiversity, promoting ecologically sustainable development for Australia's oceans, and encouraging equitable, efficient and economic utilisation of resources and job creation (Kriwoken & Fallon 2004; Kriwoken *et al.* 2006). The fisheries are also managed in accordance with national legislation by AFMA whose managers allocate market orientated statutory fishing rights (SFRs) through a competitive tender system that is fully transferable.¹⁵⁷ They also use a co-management model to bring government officials, scientists, industry members, academics and NGOs with an interest in toothfish to the negotiation table (AFMA 2005e, f; Respondents 17 and 54). The model advocates a public and transparent fisheries process and was enshrined in the *Fisheries Management Act 1991* that embraces a partnership approach between governments and the fishing industry in particular. However, the two fisheries have different international management contexts.

SFRs are issued by AFMA fishery managers for the HIMI Patagonian toothfish fishery and they allow access to specific proportions of the annually determined CCAMLR TAC (AFMA 2003a, b, c; Scientific Certification Systems Inc. 2005). Three vessels are permitted into the fishery at any one time through a minimum quota holding system

¹⁵⁷ Austral Fisheries Pty Ltd was the only operator permitted into the Macquarie Island fishery. However, from mid-2006, half the available SFRs were sold by a competitive tender process (see Abetz 2006).

where any one operator must hold at least 25.5 per cent of the SFRs in order to fish.¹⁵⁸ Australian authorities have also determined how the Australian Government recognises the efforts that individual fishing operators have made in developing new and exploratory fisheries (Respondent 17). Here, access rights are allocated to the fishers that develop a fishery.¹⁵⁹ Along with AFMA, the AAD, other government departments and various inter-departmental committees, fora, working groups and teams including the management focused SouthMAC, the research focused Sub-Antarctic Resource Assessment Group (SARAG) (formally known as the Sub-Antarctic Fisheries Assessment Group [SAFAG]) and the policy focused CCF, also contribute to the management of this fishery and consider fishery issues with regard to broader policy issues, international treaty obligations and foreign policy implications (Figure 4.4).¹⁶⁰



¹CCAMLR fisheries – HIMI fisheries and new and exploratory Antarctic fisheries; ²Australian fisheries – HIMI fisheries, Macquarie Island fisheries, and new and exploratory Antarctic fisheries; ³DEH, AFMA, DAFF, DFAT, ACS

Figure 4.4: Management of the Australian toothfish fisheries

¹⁵⁸ Austral Fisheries Pty Ltd holds 71 per cent of the quota. Kallis & France Group, Petuna Sealord Pty Ltd and Everfresh Seafoods Pty Ltd purchase additional quota allocations to access the fishery.

¹⁵⁹ For the Macquarie Island and HIMI fisheries, developers will receive, or have received, at least 50 per cent of the fishing rights to reward their efforts and losses in developing a fishery (Respondent 17).

¹⁶⁰ Expertise is drawn from Australian Government departments and science organisations including the Departments of Environment and Heritage (DEH), Agriculture, Fisheries and Forestry (DAFF) and Foreign Affairs and Trade (DFAT), the Australian Customs Service (ACS) and CSIRO.

The SouthMAC is a Southern Ocean fisheries advisory committee that provides advice to the AFMA Board and was formed in November 1998 (AFMA 2005a; Scientific Certification Systems Inc. 2005).

The SARAG is a research group established by AFMA in 1997 to provide advice in relation to stock status, environment, and economics of Southern Ocean fisheries. It recommends management measures through the SouthMAC to the AFMA Board that are consistent with the approaches taken in CCAMLR.

The CCF was formed in 1996 and is coordinated by the AAD (AAD 2005a; Respondent 52). This forum provides government agencies, scientists, NGOs, researchers, and invited observers the opportunity to meet and share comments and recommendations on the toothfish fisheries.

These management committees and fora have captured actors and networks that are external to the formal system of political authority in the heterogeneous *Australian Toothfish Sub-network* (see AFMA 2006 a, b; Dean 1999; Holm 2001). They also illustrate how political and spatial scales can be rearticulated by connecting politically distant actor-networks and mobilising their support for unified outcomes, particularly in respect to mobilising national interests and securing governmental mechanisms themselves (see Selman & Wragg 1999). In this respect, this convergent actor-network is relatively stable, can be black-boxed because its behaviour is known and predictable, and is *punctuated* into a single node in the *CCAMLR Sub-network* (Figures 2.9 and 2.10).

4.5 Observations

Despite the Patagonian toothfish being central to the *Patagonian Toothfish Network*, its position can be cast into doubt. This is because it does not *choose* to become hooked onto longlines or caught in trawl nets and, therefore, it is also only ever partially enrolled in the actor-network. Nonetheless, other material actor-networks, including procedures and technology used to harvest the Patagonian toothfish, are important intermediary actors in the network because they successfully displace this species from its ecosystem. At the same time, change has occurred when fishers have developed new technologies to realise their goals and they have shifted power from trawling to longline operations and, more recently, potting. As information (in the form of data and inscriptions) became available, fishers also moved into new fisheries both inside and outside the Convention Area using advanced technological communications.

CCAMLR members manage Patagonian toothfish fisheries in the Convention Area. However, the regional *CCAMLR Sub-network* also consists of other complex associations and networks of actors that manage the fisheries at the regional level (see Callon 1987). For example, CCAMLR members increasingly need to manage *new* and *exploratory* Patagonian and Antarctic toothfish fisheries as the demand for toothfish products increase and States and fishers seek new toothfish stocks to meet this demand. At the same time, coastal States located in the Southern Ocean are also influential in national sub-networks, and they manage Patagonian toothfish fisheries in their maritime waters in accordance with national laws. If these fisheries lie inside the Convention Area, these States are also obligated to comply with legally binding CCAMLR conservation measures. However, they may choose to act dissidently and pursue national interests at the expense of the CCAMLR collective good.

Although there is information detailing the Patagonian toothfish fisheries under the control of Australian, New Zealand and United Kingdom authorities, it is difficult to comment on the Argentinean, Chilean, French, South African or Uruguayan Patagonian toothfish fisheries because these States generally *hide* the location of, and procedures and techniques to manage, toothfish fish stocks under their jurisdictions. Despite this

concealment, the existence and extension of national maritime waters has resulted in constraints and opportunities for ecosystem management in the Southern Ocean. First, the existence of maritime waters enables coastal States to protect national fisheries by enforcing environmental priorities, policies and regulations. With extended jurisdictions, these States can implement strategies to manage the Southern Ocean ecosystem (or at least large parts of the ecosystem) that may occur in any one State's jurisdiction. However, extended jurisdictions also increase the possibility of jurisdictional conflicts because the ecosystem crosses territorial boundaries. One such contested area is the Patagonian toothfish stocks found on the Patagonian Shelf near Argentina and the British controlled Falkland Islands. Conflict can also arise when trans-boundary stocks migrate between jurisdictions and are shared by two or more States, such as those on the Kerguelén Plateau between the French Kerguelén Islands and Australian HIMI. In addition, the Patagonian toothfish can migrate across multiple jurisdictions. For example, Patagonian toothfish stock from the Kerguelén Plateau has been sighted in waters around the Crozet Islands and as far as PEMI (see Australia 2005b). Other stock from the Falkland Islands has been being recaptured off the Chilean coast (see Smith & McVeagh 2000).

This discussion highlights that politics is positioned on the boundary between state and civil society where CCAMLR members and national governments seek to shape calculated and rational activity (see Dean 1999; Foucault 1991; Murdoch 2000). State actor-networks have needed to mobilise domains that lie inside and outside their borders to manage the fisheries at a distance and utilise the actions of fishers for their own objectives (see also Holm 2001; Kendell & Wickham 1998; Latour 1987; 1997). With this in mind, fisheries management is a complex undertaking for many coastal States because governments need to consider artisanal, shared and high seas toothfish stocks. These systems are characterised by more insular and sometimes unstable actor-networks where the governments strive for a high degree of centralised control. Here, *conduct* is grounded by intermediary actor-networks (for example: national policies, laws and regulations) and fisheries authorities are able to act unilaterally and decide on whether to consult with fishers and other stakeholders. Nonetheless, the *Australian Toothfish Sub-network* of open consultation and co-management appears the most stable.

Chapter 5

Pressures on the Toothfish Fisheries

5.1 Introduction

This chapter explores narratives among non-state actors and associates the Patagonian toothfish with IUU operators in illicit fishing and market actor-networks. An analysis of the incidence of IUU fishing, and the dilemmas of stopping IUU fishing and trade in Patagonian toothfish products is then described. Some of the actor-networks in this discussion perform in a highly mobile and dissident manner, and apply pressure upon the Patagonian toothfish at the expense of other actor-networks in the *Patagonian Toothfish Network*. Such actor-networks engage in IUU activities but in different ways. Illegal and unreported fishing is conducted in national maritime waters in the Southern Ocean, or in the Convention Area on the high seas if fishers are from CCAMLR member or co-operating States. Fishers operating in the Convention Area on the high seas act in an unreported and unregulated manner if they operate vessels without nationality or fly the flag of States not party to the Convention on the Conservation of Antarctic Marine Living Resources. Other fishers operating outside the Convention Area on the high seas are able to fish in an IUU manner. Pressure on the Patagonian toothfish fisheries also arise from IUU market activities where dissident market actor-networks sell IUU toothfish products to any available market. In an effort to maximise short-term profits at the expense of all other actor-networks, as Figure 5.1 illustrates, IUU operators cut or weaken (destabilise) the Patagonian toothfish's links with the Southern Ocean, other operators, CCAMLR members and national governments, scientists and researchers, IGOs and NGOs, processors, traders and consumers of legitimately caught fish, and the general public (see Callon 1986 in Section 2.4.3).

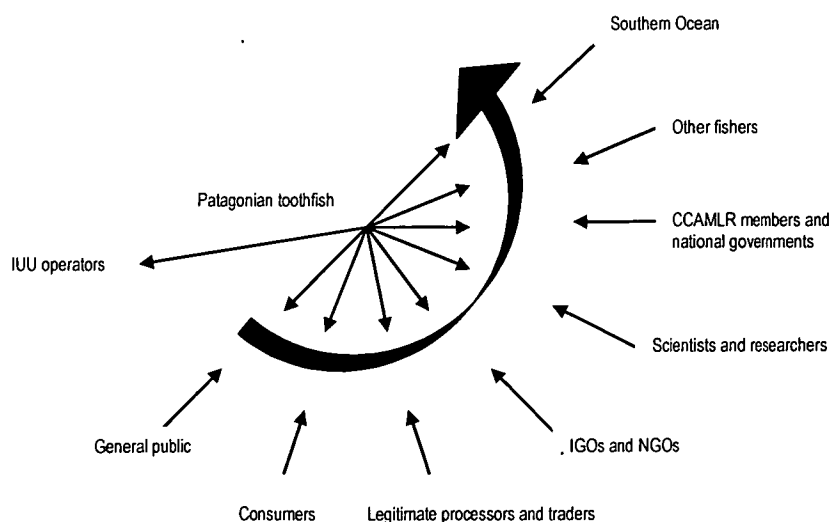


Figure 5.1: *Interessement* on the in-between where illegal operators interest the Patagonian toothfish

5.2 IUU fishing activities

5.2.1 Trans-national crime

IUU fishing activities pressure many of the world's fisheries and destabilise the *Patagonian Toothfish Network*.¹⁶¹ In the Southern Ocean, IUU fishers have predominantly targeted Patagonian and Antarctic toothfish, but krill and Mackerel icefish have also been targeted (Hutchison 2004). Most notably, IUU fishers connected with the Patagonian toothfish in 1991/92 when they commenced IUU fishing activities around South Georgia as detailed in Table 5.1 (Agnew & Kirkwood 2005; CCAMLR XIV 1995; Constable *et al.* 2000; Tuck *et al.* 2003). It then flourished within other national maritime zones.

Table 5.1: Estimated dates when IUU fishing for toothfish began

CCAMLR Area	Associated island or bank	National sovereignty	Estimated start of IUU fishing
48.3	South Georgia	United Kingdom	1991
58.6	Crozet Islands	France	Apr/May 1996
58.7	PEMI	South Africa	Apr/May 1996
58.4.4	Ob and Lena Banks	High seas	Sep 1996
58.5.1	Kerguelén Islands	France	Dec 1996
58.5.2	HIMI	Australia	Feb/Mar 1997
58.4.3a and 58.4.3b	Elan and BANZARE Banks	High seas	Feb/Mar 1997
88.1 and 88.2	Ross Sea	New Zealand*	Jan 2002

* New Zealand makes some claim of sovereignty in this region although it is on the high seas
Adapted from: CCAMLR (2000a; 2005f); Pearce (1996); Stone (2002b); Tuck *et al.* (2003)

Large numbers of IUU fishers spread rapidly eastwards and by 1996, they were noticed in the western Indian Ocean around the South African PEMI and the French Kerguelén and Crozet Islands (Agnew 2000; Sabourenkov & Miller 2004; Tuck *et al.* 2003) (Figure 5.2).¹⁶² By 1997, IUU fishers were sighted around the Australian HIMI, and in January 2002 vessels engaged in IUU fishing were noticed in Antarctic waters south of 60°S (Stone 2002b).¹⁶³ IUU fishing has continued unabated as exemplified by the United States Attorney for the Southern District of Florida recently indicting Antonio Vidal Pego (a Spanish national) and Fadilur S.A. (a Uruguayan corporation) on federal charges in September 2005 with allegedly conspiring to import approximately 53,000

¹⁶¹ For example, illegal fishing for Tropical bigeye tuna (*Thunnus obesus*) in the Atlantic Ocean began in the early-1980s, and Swordfish (*Xiphias gladius*) and Northern bluefin tuna (*Thunnus thynnus*) continue to be subject to IUU fishing in this ocean (see Tuck *et al.* 2003). Illegal fishing has increased in the Indian Ocean since the mid-1980s where tuna, swordfish and billfish species have been pressured.

¹⁶² This highly profitable fishery led to the emergence of an IUU longline fishery in 1997 which continues to operate. According to Greenpeace (2000d), in just one year, IUU fishing around Crozet Island reduced Patagonian toothfish stocks by 25 per cent, and by 1998 the fishery was commercially extinct.

¹⁶³ From 1995, "the waters around many sub-Antarctic islands in the Convention Area that are under national sovereignty had been invaded by large numbers of fishing vessels" (Johanson 1997: 222).

pounds of toothfish (worth over US\$310,000) from Singapore into Miami in July 2004 after they falsified the catch documentation (Fleshler 2005; United States 2005). In September 2005, Australian authorities also apprehended the Cambodian-flagged *Taruman*, the first vessel suspected of fishing illegally in Australian maritime waters around Macquarie Island (ABC 2005a, b; Bevan 2005; Macdonald & Ellison 2005b).¹⁶⁴

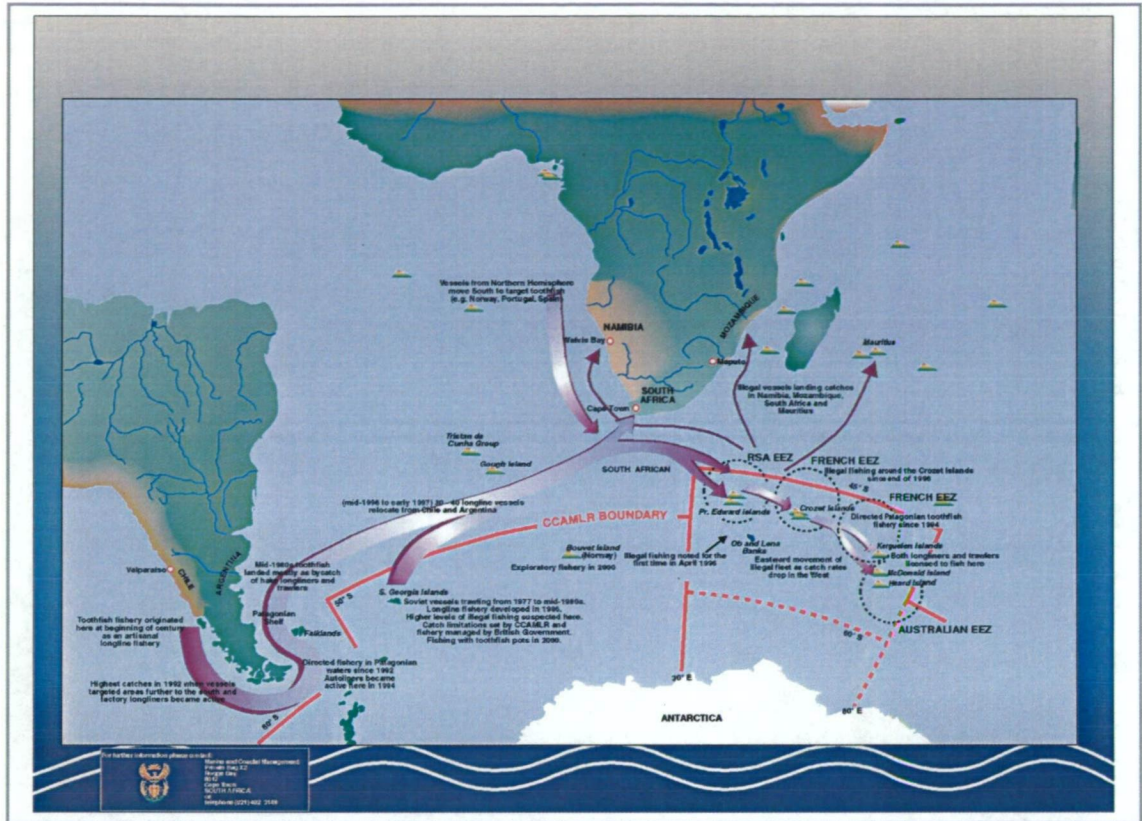


Figure 5.2: Progressive development and location of IUU fishing for toothfish in the Convention Area (Source: Sabourenkov & Miller 2004: 72)

States that are suspected or alleged to have been involved in IUU fishing or trade, either as flag States, countries of vessel ownership, nationality of master, or ports of landing, are all detailed in Table 5.2. Although many States now legitimately manage Patagonian toothfish, fishers from these States may have been involved in IUU fishing activities in the past (see Mascoli 2004). Of particular concern have been recent IUU activities by Uruguayan fishers widely criticised internationally and in CCAMLR for supposedly illegally fishing toothfish stocks, particularly after the seizure of the Uruguayan-flagged fishing vessels *Maya V* and *Viarsa I* in 2004 after they were suspected of illegally fishing around HIMI (see AAD 2004c, h). In addition, CCAMLR members are critical of Ukrainian-flagged fishing vessels (such as *Mellas* and *Simeiz*) for the crews suspected involvement in IUU activities (CCAMLR XXIII 2004a). Refer to Appendix C for a historical account of IUU vessel sightings and arrests.¹⁶⁵

¹⁶⁴ The crew included Chilean, Ukrainian, Russian, Peruvian and Spanish nationals (Bevan 2005).

¹⁶⁵ According to Respondent 47, Uruguayan fishers, including those who are members of SUNTMA and SUDEPPU “were (and are) actively involved in illegal [fishing] issues.”

Table 5.2: The main States and entities suspected of past or current involvement in IUU fishing or having an interest in trade activities

Involvement in IUU fishing	CCAMLR member	Involvement in IUU fishing	CCAMLR member
Angola	non-Contracting	Mozambique	non-Contracting
Argentina	Member	Namibia	Member
Belize	non-Contracting	Norway	Member
Bosnia-Herzegovina		Panama	non-Contracting
Cambodia		Philippines	non-Contracting
Chile	Member	Portugal	
China	non-Contracting	Republic of Korea	Member
Columbia	non-Contracting	Russian Federation	Member
Denmark		Sao Tomé & Príncipe	non-Contracting
Dutch Antilles*		Seychelles	non-Contracting
Equatorial Guinea		Singapore	non-Contracting
France	Member	South Africa	Member
Georgia		Spain	Member
Honduras		St. Kitts & Nevis	
Indonesia	non-Contracting	St. Vincent & Grenadines	non-Contracting
Japan	Member	Thailand	non-Contracting
Kenya	non-Contracting	Togo	non-Contracting
Madagascar	non-Contracting	Ukraine	Member
Malaysia	non-Contracting	United Kingdom	Member
Mauritius	Contracting Party	Uruguay	Member
Mexico	non-Contracting	Vanuatu	Contracting Party

* The Dutch Antilles is an overseas part of the Netherlands, a CCAMLR Contracting Party.
 Adapted from: AAD (2003a, b; 2006); Austral Fisheries Pty Ltd (2002); Bevan (2005); CCAMLR XXIII (2004a); Australia (2004 f, g, h; 2005g); COLTO (2003c; 2004a); Dodds (2000); ISOFISH (1998a, b; 1999b), ITLOS (2000c); Hanich (1999); Jeon (2004); Lack & Sant (2001); Macdonald & Ellison (2005a, b, c); Mascoli (2004); Masters (2002); Respondent 25; TRAFFIC (2001a, b)

Given the high market value of toothfish and the decline of fish stocks worldwide, Lack and Sant (2001: 1) attribute the proliferation of IUU fishing to “the remoteness of the main fishing grounds and the resultant difficulties and high costs associated with effective surveillance and the relatively low risk of being detected.” So lucrative is IUU fishing that since 2000, it has changed from being a single consortium operation to involving highly organised and well financed trans-national *criminals* (AAD 2003a; 2005d; ABC 2005a, b; CDNN 2002; HSTF 2006; HSI 2002a, c, d; Macdonald 2004b, c; Masters 2002; Respondents 38 and 61; Trent *et al.* 2005). In this context, these operators powerfully mutate the *Patagonian Toothfish Network* by challenging the moral and legal status of different kinds of fishing, namely *responsible* versus *criminal* fishing activities. IUU operators exercise their freedom and operate in a manner that destabilises the resource management actor-network of the Patagonian toothfish when they make visible, their own sub-networks. They mobilise fleets to avoid capture by

sacrificing old and less sophisticated vessels to authorities in order to allow the rest of the fleet to avoid apprehension (Respondents 49, 52 and 58).¹⁶⁶ These survivors operate in the modern globalised economy that allows them to mobilise vast amounts of capital and exploit a monetary system that lets them move this capital around the globe with few restrictions. As such, they form a hidden, divergent, highly mobile, unstable connections in the *Dissident IUU Sub-network*. They connect with others by mobilising intermediary actor-networks and translating power through a complex, global corporate structure that authorities struggle to penetrate. Beneficial owners remain concealed behind declared company owners, flag State registration, and complex fishing, processing and trading arrangements (Figure 5.3). Because the activities of actor-networks in the *Dissident IUU Sub-network* are uncertain, precarious and widely scattered, it cannot be black-boxed nor is it *punctuated* into a single node in the *Patagonian Toothfish Network*.

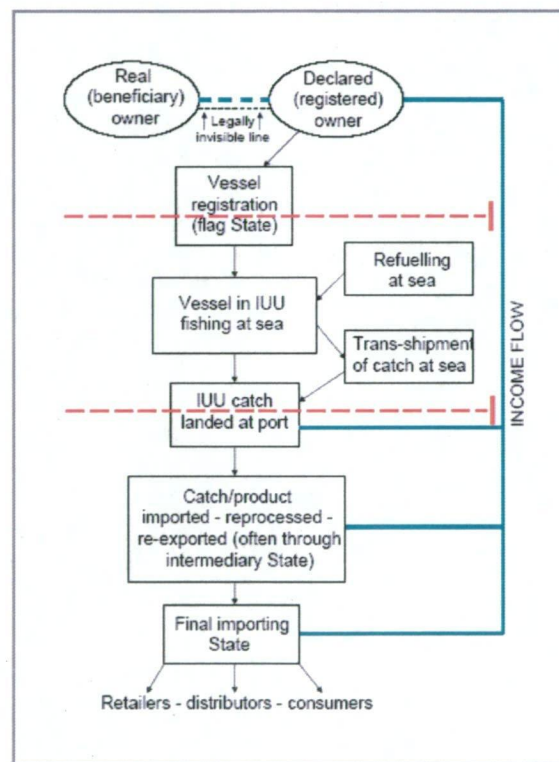


Figure 5.3: Complex IUU fishing arrangements (Source: Vidas 2003; reprinted in Vidas 2004; also in Stokke & Vidas 2004)

Most notably, the activities of the Hong Kong based Pacific Andes fishing syndicate and Spanish based Galician fishing syndicate (that has connections with the Pacific Andes) have been scrutinised by the fishing industry (Austral Fisheries Pty Ltd 2002; COLTO 2003c; *Mercopress.com* 2004a). These syndicates exert considerable power, making their operations increasingly efficient by pooling resources, sharing expertise

¹⁶⁶ Integrated and globalised IUU corporations cut across national boundaries. These corporations are characterised by their quasi detachment from the interests and values of their State of origin. Although they start and initially grow in a particular State, they often jump its borders when labour costs, regulations or tax conditions compromise their operations (see Wapner 2000).

and mobilising ever more sophisticated technology to harvest greater quantities of toothfish per vessel. They then need fewer vessels to catch fish, which in turn reduces their exposure in the fishery and the chance of being detected or apprehended. The operations are also characterised by significant finance, complex logistics to mask the source and identity of the catch (that includes re-supplying and refuelling at-sea and trans-shipping catch at-sea), disregard of international standards such as pollution standards under MARPOL, and access to ports in States which give little scrutiny to vessel movements and catch landings (AAD 2006; Cascorbi 2002; FMNH 2004; Gianni & Simpson 2004; 2005; MAPA 2002; MARPOL 73/78, Mascoli 2004; Stokke & Vidas 2004; *The Bulletin* 2002). These fishers mobilise active intelligence-gathering operations about States' enforcement efforts. They flee from authority when challenged, destroy evidence and endanger themselves and those in pursuit. If caught by authorities, the substandard vessels are sacrificed by their owners, and the crew keeps silent about their employers and financiers in an effort to retain their employment.

IUU operators exploit their crews, at least some of whom come from poor and under-developed States and often work under poor social and safety conditions. They also reportedly use deficient State regulatory regimes to their advantage, for example by financing significant legal challenges when vessels are seized and crews arrested (see AAD 2003a; Balton 2004; Brown 2000; Greenpeace Australia Pacific 2004; Hatcher 2004; Stone 1998; Whitlow 2004). Of particular concern is the possibility that operators may also use IUU vessels to mask other criminal activities such as drug, people or weapons smuggling (ABC 2005b). According to the Florida Museum of Natural History, IUU vessels are known to have disappeared in recent years, taking about 100 people with them (FMNH 2004). For Respondent 52, the failure of IUU fishing operators to ensure crew safety is a "shocking situation" that is condemned by the International Maritime Organisation (IMO) and International Coalition of Fisheries Associations (ICFA). It has also been raised in FAO meetings including the 1999 and 2000 meetings of Technical Experts in the development of the IPOA-IUU. Therefore, the environmental and social costs of IUU fishing are high because operators challenge ecological, moral and legal norms when they exploit the Patagonian toothfish, the environment and their crew for their own benefit. IUU fishers do this in a manner that certain actor-networks criticise because it is conducted in a negligent and inhumane way where IUU fishers remain unaccountable for their actions. This discussion also highlights that the connections exploited crew make in the *Dissident IUU Sub-network* are precarious and limited to the associations they form with other actor-networks that seek to take advantage of them.

For example, Gianni and Simpson (2005) report that human rights abuses and poor safety conditions are common onboard IUU vessels. They refer to the case of the reportedly unseaworthy Sao Tomé & Príncipe-flagged longliner *Amur* which sunk in Kerguelén waters in October 2000 killing 14 of the crew when the life-saving

equipment failed. They also report on the suspicious fire onboard the Ukrainian-flagged fishing vessel *Simeiz* in the Port of Montevideo, Uruguay, in June 2005 when 11 (mainly Chinese) crew members, who were probably locked in their cabins, died (see also Garcés 2005; HSTF 2006). The sinking of the dilapidated South African-flagged stern trawler *Sudurhavid* also highlights the poor and dangerous working conditions that some crew members experience whilst working onboard IUU vessels. In this case, the *Sudurhavid* sank near SGSSI off the Argentinean coast in June 1998 after being altered to facilitate longline fishing gear (Attorney General 2004; *Dispatch Online.com* 1998a; Tucker 2001).¹⁶⁷ Crew onboard the *Sudurhavid* were fishing for Patagonian toothfish, with up to 85 metric tonnes of toothfish onboard (de Villiers 1998b), when the stability of the vessel faltered in heavy seas because the bilge pumps were blocked with offal (Attorney General 2004). Of the 38 crew onboard, 17 lost their lives and 21 survived (*Dispatch Online.com* 1998b). The FAO commented that the South African Registry was negligent in the application of the provisions of the South African *Merchant Shipping Act, 1951* in failing to ensure that the *Sudurhavid* was seaworthy (Mitchell & Broadhead 2004), and the South African Court of Marine Enquiry concluded that the loss of the vessel and lives was due to the failure of those in command to take the prevailing weather conditions into account (Tucker 2001). The Court of Marine Enquiry also noted the harsh conditions under which the crew were employed and worked (Bray 2000) and concluded that the vessels' operators failed to comply with the *South African Maritime Safety Occupational Regulations, 1994* and the *Code of Safe Working Practices on Fishing Vessels* (Tucker 2001). In addition, in the Coroner's Court Inquest of Falkland Islands, Coroner Watson commented on the poor physical health of the crew prior to the tragedy (Watson in Bassett 2000). These examples illustrate that the proliferation of policies, laws and regulations fail to protect vulnerable fishers.

IUU operators also appear to disguise the real owners and beneficiaries of IUU fishing by deploying multifaceted and secretive corporate arrangements from a distance, and may have access to legal advice that allows exploitation of deficiencies in national and international fisheries and corporate law (AAD 2005d; Australia. 2002b; FMNH 2004; OECD 2004a). For example, Exel (2004a, c) explains that although the vessel owner or the director of a number of different companies who is involved in fishing activities such as holding a fishing licence, employing crews and marketing and exporting fish products may be the same person, their identity as the beneficial owner is often camouflaged through an elaborate actor-network of company structures that are located in different States. He illustrates that company A from one State purchases and owns the factious vessel *Hale* (Figure 5.4). *Hale* is then sold to company B that is located in

¹⁶⁷ There is very little information detailing this sinking. However, after being modified, the *Sudurhavid* was identified as an IUU vessel operating around South Georgia and Kerguelén Island "with no lights, trans-shipping fish from one ship to another and always being on the lookout for a gunboat" (Bray 2000: 52). In the Coroner's Court Inquest of Falkland Islands (Watson 1998: 18 in Bassett 2000: 94) Coroner Watson states that the vessel alterations contributed to the sinking. Kaira (2001) also states that the now longliner, *Sudurhavid*, first sunk in rough seas in 1996, killing three crew members including the skipper.

another State. Company B renames the vessel *Halo* to conceal its State of origin and fishing history. Company C, located in a third State then charts *Halo* in order to access the fishery. However, company C harvests fish under the fishing licence owned by the separate company D to ensure that no connection is made between the fishing licence owner and the origin and history of the vessel. Company D may, or may not, be located in the same State as company C. In order to conduct its fishing activities, company C (the charterer of *Halo*) employs a crew from company E from yet another State. Finally, once the fish are harvested they are sold to the global markets through company F that is located in an entirely separate State. Given the complexity of the IUU fishing industry, it is difficult for national governments, CCAMLR members and licensed fishers to identify rogue vessels or operators. Consumers are also unable to distinguish between legitimately or illegally caught fish when making purchases.

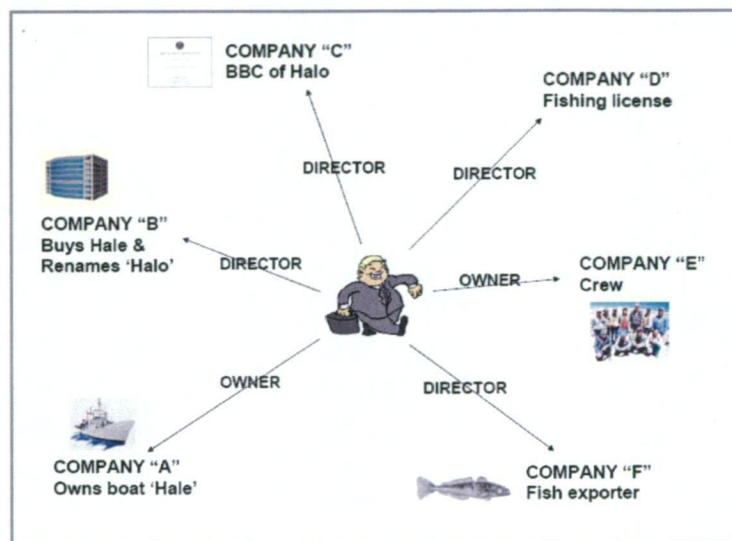


Figure 5.4: Elaborate company structures hide the identity of beneficial owners
(Source: Exel 2004c: no page)

5.2.2 The extent of IUU fishing

Critical analyses of IUU fishing activities are relatively new in the literature on fisheries governance and policy, with the first formal mention of it emerging in relation to Patagonian toothfish only in 1997 at the sixteenth CCAMLR meeting in Hobart, Australia (CCAMLR XVI 1997a).¹⁶⁸ At that meeting, CCAMLR members agreed that large scale IUU fishing in the Convention Area by Contracting and non-Contracting Parties to the Convention on the Conservation of Antarctic Marine Living Resources undermined the work of CCAMLR members in achieving its objectives and the extent of IUU fishing posed a serious threat to Patagonian toothfish stocks and to seabirds taken as incidental bycatch in longlining operations. They also noted that non-Contracting Parties ignored the Convention on the Conservation of Antarctic Marine

¹⁶⁸ IUU fishing also emerged in the media in 1997. For example, Australian journalist, Andrew Darby, published "Battles predicted in our southern seas" in the *The Age* in 1997 (Darby 1997: page unknown).

Living Resources and sovereign rights of coastal States in the Convention Area, and that collective effort was needed to enhance enforcement and compliance with CCAMLR conservation measures regarding marine living resources in the Convention Area (CCAMLR XVI 1997a). This discussion marks the point at which the activity of governing the toothfish fisheries, and shaping the conduct of CCAMLR members and others, was called into question and became problematised.

Coincidentally, at this meeting the SC-CCAMLR lifted its recommendation for aggregate TACs for Patagonian toothfish in the Southern Ocean by 27 per cent (CCAMLR 1997b). The TACs were lifted as a result of new fishing areas being opened up in the Ross Sea and in light of new stock assessment results from research surveys (Respondent 12). However, given that TACs were based on an assumption that future IUU fishing efforts would be zero, some NGOs (including ASOC and Greenpeace) disagreed with the increase as they considered that TACs were not being appropriately discounted and the precautionary approach was not being implemented (Respondent 38). They called for a total closure of the fishery, arguing that an increased legal catch would add to the already dangerous depletion of toothfish stocks (Darby 1997). Although CCAMLR members were aware of the problems associated with IUU fishing, they were concerned that the inclusion of future IUU fishing efforts in management decisions might legitimise the practice. In addition, if IUU catches were taken into account in future TAC allocations, then TACs would be reduced for legitimate fishers, thus opening up additional stock for IUU fishers (Respondent 12).

The CCAMLR XVI meeting highlighted that there was significant scientific uncertainty about toothfish stocks generally, and that little was known about which actor-networks were involved in IUU activities and the level of IUU fishing effort impacting on toothfish stocks. These issues continue to have impact upon these stocks. During 1997, it was thought that up to 100 IUU vessels operated in the Convention Area, with most allegedly owned by Spanish, Norwegian and Chilean companies (Agnew 2000; Darby 1997; Martin 1997 in Bateman & Rothwell 1998; Respondent 38; Sabourenkov & Miller 2004). While these companies were based in CCAMLR member States, many of the vessels owned by these actor-networks avoided CCAMLR conservation measures by fishing under FOCs from non-CCAMLR States (Clark & Hemmings 2001; Choquet 2003; DeSombre 2005; Murdoch 1997; Vidas 2000).¹⁶⁹ In addition, other vessels previously flagged to FOC States and/or with a history of IUU fishing have also re-

¹⁶⁹ As stated, FOC States are not required to comply with the Convention on the Conservation of Antarctic Marine Living Resources, and accept money for ship and fisheries registration fees without questioning whether the activities of those vessels' crews are legal. For Quirk (1999), FOC vessels not only pose risks to general safety standards and the environment, their owners gain significant competitive advantages over responsible operators. In 1998, approximately five per cent of the world's fishing vessels operated under FOCs (~1,000 large-scale vessels) (see FAO 1998a; UNEP 2004) and by 2005, up to 15 per cent of the world's fishing vessels were either flying FOCs (~1,200 large-scale vessels) or the identity of the flag was unknown (Gianni & Simpson 2005). Unregulated vessels engaged in illegal fishing include those from Belize, Honduras, Mauritius, Namibia, Panama, St Vincent & Grenadines, Togo and Vanuatu (Figure 5.2).

flagged to CCAMLR member States in an effort to access the fisheries including *America 1*, *American Warrior*, *GlobalPesca 1*, *Magallanes III* and *Simeiz* (Gianni & Simpson 2005). More recent estimates suggest that 50 to 60 IUU fishing vessels are operating in the industry, carrying 40 crew per vessel (Respondent 49).¹⁷⁰ COLTO (2003c) puts the current estimate at approximately 40 IUU vessels that have been involved in IUU fishing or have supported IUU fishing since 2001, and identifies that up to 20 IUU vessels are currently active in the fisheries (as of January 2005) (Respondent 12).¹⁷¹ However, it is not known how many beneficiaries control IUU toothfish fishing because the FOC States they are registered under do not have applicable legislation to regulate vessels or fishers under their jurisdiction (Agnew & Barnes 2004; Gianni & Simpson 2004; Lugten 1997). In these cases, fishers exercise their common law right under LOSC to fish the high seas, and it is the failure of FOC States to act against these operators that compromises their ability to establish links across the fishing vessel, fishers, companies, or beneficial owner. Consequently, it is difficult to establish who is involved in IUU fishing activities, where their operations are based, whether they are from CCAMLR member States, whether they then embed their activities in *front* companies registered in States not party to CCAMLR, or whether they use ports and markets outside CCAMLR's domain (AAD 2003a; Molenaar 2001; TRAFFIC 2001a, b; *SARTMA.com* 2004).¹⁷² Therefore, it is also hard to verify how they connect in the *Dissident IUU Sub-network* or to describe the associations they make with other actor-networks.

Estimating the scope and scale of IUU fishing is notoriously difficult (Agnew & Kirkwood 2005; HSTF 2006; Trent *et al.* 2005). Nonetheless, in the 1996/1997 fishing season, IUU toothfish catch landings peaked, with the FAO (2000) estimating that the IUU catch accounted for up to 50 per cent of the total global catch. IUU catches at that time were estimated in excess of 100,000 metric tonnes and valued at more than US\$375 million (Dodds 2000; Perry 1998). In particular, "minimum estimates of IUU catch indicate that around one-third" of the total catch "in the late-1990s was attributed to IUU fishing" (Lack & Sant 2001: 1). Other estimates put IUU fishing at five times the legal quota (CCAMLR 2002a), with the actual toothfish take being quadruple CCAMLR's maximum projected ecologically safe amount (CCAMLR XVI 1997a).¹⁷³ For Respondent 4, IUU fishing is the greatest threat to the fishery because "it accounts

¹⁷⁰ Infrastructure attached to these vessels is estimated at about 3:1 and approximately 1500 people are possibly involved in the illegal toothfish fishing (Respondent 49).

¹⁷¹ Suspected IUU fishing vessels are listed on the COLTO website at (www.colto.org).

¹⁷² For example, Australia (2006: 3) states that the Australia and New Zealand delegations to CCAMLR XXIV in 2005, expressed concern at information submitted to the Commission "suggested that the owner of *Galaecia*, the exploratory fishing vessel notified by Spain, and the *Paloma V*, notified by Uruguay, appeared to have links to companies, vessels or persons involved in IUU fishing."

¹⁷³ Calculating IUU catches is based upon many sources including the type and size of CCAMLR licensed vessels; number, type and size of sighted IUU fishing vessels; recovered illegal longline gear; landings; catch and effort information from seized IUU fishing vessels; verified media information; and known catch and trade statistics (see Sabourenkov & Miller 2004). Therefore, IUU catch rates vary significantly, and commentators are only able to estimate the extent of these catches.

for over 60 per cent of the industry.”

Reductions in IUU fishing occurred in the 1998/99 fishing season. Nonetheless, an increase in IUU fishing from 2000 allegedly occurred as new Asian actor-networks, reportedly from Hong Kong and Indonesia, entered the fishery (Austral Fisheries Pty Ltd; 2002; Clark & Hemmings 2001; COLTO 2003a; Masters 2002). In addition, at the twenty-first CCAMLR meeting in 2002, members were concerned that catches from outside the Convention Area in FAO Statistical Areas 51 and 57 were most likely to have been misreported and caught inside the Convention Area or they would have seriously depleted whatever stocks that might be present in these areas (CCAMLR XXI 2002c).¹⁷⁴ They also noted that levels of IUU fishing continued to deplete stocks around PEMI, Kerguelén and Crozet Islands, HIMI and the Ob and Lena Bank regions, and that current levels of IUU fishing would continue to reduce substantially seabird populations as a result of bycatch in longline fishing operations (CCAMLR XXI 2002c). Clearly, IUU fishing is a significant problem, estimates on IUU fishing activities are uncertain, and measures to stop these activities have been ineffective.

It is not possible to provide a definitive calculation of catch estimates (particularly for IUU catch) and the figures are likely to under-estimate the stock harvested. Estimated toothfish catches reported from 1996/97 to 2004/05 are summarised in Table 5.3 and Figure 5.5 illustrates toothfish catches from 1983/84 to 2004/05. For example, although some CCAMLR data estimate the IUU toothfish catch in the Convention Area during the 2003/04 fishing season at 2,622 metric tonnes (CCAMLR 2004c), other CCAMLR data estimate that 15,922 metric tonnes were taken (CCAMLR 2005b). TRAFFIC (2001b) explains that a likely reason for the variations in these figures may lie in the shortcomings of the estimates themselves. CCAMLR also acknowledges that it is difficult to estimate IUU catch because fish are trans-shipped at-sea generally outside the Convention Area and landed under different species names.

¹⁷⁴ Misreporting catches reportedly caught outside the Convention Area was extensively discussed at Australian SouthMAC and CCF meetings from 2002 to 2005. Australian authorities remain concerned that Patagonian toothfish caught on Williams Ridge (just outside the HIMI and only partly inside the Convention Area) could not be caught legitimately from such a small area (CCAMLR 2002c, f).

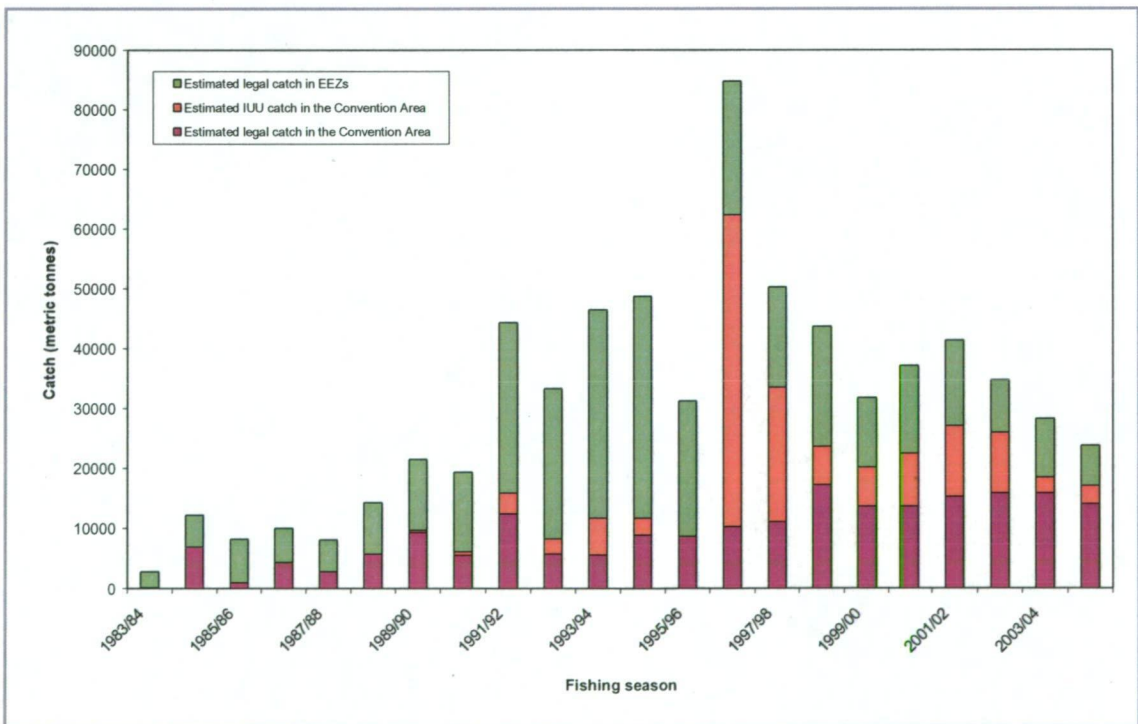
Table 5.3: Estimated toothfish catch (metric tonne) (mostly Patagonian toothfish) by regulated and IUU operations from 1996/97 to 2004/05

Catch	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05 ¹
Estimated legal catch, CA ²	10,371	11,170	17,278	13,689	13,725	15,302	15,931	15,877	14,074
Estimated legal catch in EEZs	22,365	16,698	20,041	11,553	14,619	14,195	8,744	9,763	6,673
Total estimated legal catch	32,736	27,868	37,319	25,242	28,344	29,497	24,675	25,640	20,747
Estimated IUU catch, CA	52,000	22,415	6,413	6,546	8,802	11,857	10,070	2,622	3,023
Total estimated catch, CA	62,371	33,585	23,691	20,235	22,527	27,159	26,001	18,500	17,094
Estimated IUU landings	68,234 ³	26,829 ³	16,636 ³	8,418	N/A	N/A	N/A	N/A	N/A
Total estimated catch	100,970	54,697	53,955	33,660	56,445	62,643	44,920	34,306	25,605

*Note, estimated data only because toothfish catch data is notoriously inconsistent and in some cases includes only Patagonian toothfish and in other cases both Patagonian and Antarctic toothfish.

¹Based on data available to the CCAMLR Secretariat to October 2005; ²Convention Area; ³Estimate of IUU landings may be overestimated due to misidentification or double-counting

Adapted from: AFMA (2005e); CCAMLR (1998; 1999a, b; 2000a, b; 2002c, d; 2003a; 2004c, e; 2005f, g, h); Fallon & Kriwoken (2004); Fallon & Stratford (2003a); Lack & Sant (2001)



*Note, estimated data only that provide a general indication of toothfish catches.

Catch outside the Convention Area includes estimated EEZ catch plus estimated high seas catch.

Adapted from: Agnew (2000); CCAMLR (2002c, d; 2003a; 2004c, e; 2005f, g, h); Fallon & Kriwoken (2004); Fallon & Stratford (2003a); Lack & Sant (2001)

Figure 5.5: Estimated catch (metric tonne) of toothfish (mostly Patagonian toothfish) from 1983/84 to 2004/05

Nonetheless, the total IUU catch of toothfish from 1998 to 2003 may be “almost equal to the total catch by licensed fishers (80,960 metric tonnes and 83,696 metric tonnes, respectively)” and worth about US\$755 million in wholesale value (AAD 2003a: 16). Moreover, new data presented in 2004 at the twenty-third CCAMLR meeting suggest that IUU fishing decreased by 75 per cent in the Convention Area, from approximately 10,000 metric tonnes in the 2002/03 fishing season to approximately 2,600 metric tonnes in the 2003/04 fishing season (AAD 2004a; CCAMLR XXIII 2004a; *Fish Update.com* 2004) (Table 5.3 and Figure 5.5). In addition, coastal States also indicated that IUU fishing activities were reduced in the 2004/05 fishing season, and the SC-CCAMLR identified that the estimates for 2005 are similar to 2004 (CCAMLR 2005f). For example, French authorities believe that 360 metric tonnes of IUU toothfish were harvested from its maritime waters during the 2003/04 fishing season as opposed to 30,000 metric tonnes between 1997 and 2001 (CCAMLR 2004c; Respondent 58). Australian authorities also believe that IUU fishing was reduced by over half of that from the previous season (AAD 2004a), and no reported IUU fishing was detected in SGSSI waters (CCAMLR 2004c; Respondent 2).

However, these data have yet to be verified because they are based on minimum estimates and incomplete, subjective and reduced IUU vessel sightings, and not necessarily a decline in IUU toothfish harvesting or trade (see CCAMLR 2005d, f; Agnew & Kirkwood 2005; Willock 2004).¹⁷⁵ The data is difficult to assess given that States trade different toothfish products, apply their own trade codes to these products and collect different statistics. Sabourenkov and Miller (2004: 74) acknowledge that CCAMLR’s estimates of IUU caught toothfish are “unlikely to be overly accurate and probably represent rather coarse approximations”, and ASOC (2004c: 1) restated its concern that the “current levels of IUU seem to be an under-estimate.” Unless there are corresponding and verifiable declines in trade and availability of toothfish, fewer IUU vessel sightings do not necessarily mean that there is less IUU fishing.

5.2.3 Incidental mortality of non-target species

Inhuman material actor-networks in the Patagonian toothfish fishery, such as trawling and longlining, cause varying degrees of environmental damage not only to the toothfish, but also to other nonhuman actor-networks in the *Patagonian Toothfish Network*. Trawling indiscriminately catches non-target species such as Humped Rockcod (*Gobionotothen gibberifrons*) or various icefish species and skates (*Raja Georgiana* and *Bathyraja spp.*), and it damages benthic communities when nets are dragged across the seabed and scrape and plough the substrate or resuspend sediment (Gianni 2004b; Kimball 2004). Marine mammals can also become entangled in trawl

¹⁷⁵ The SC-CCAMLR estimate the likely IUU catch rate as follows: IUU catch = [number of observations of activity] x [trip duration (days)] x [number of trips per year] x [catch rate (metric tonnes per day)] (CCAMLR 2005f). Agnew and Kirkwood (2005) and Ball (2005) describe two new methods for estimating IUU catches. Pritcher *et al.* (2002) also outline methods to estimate global IUU catches.

gear, and trawling operations cause seabird mortality when seabirds become entangled in the nets or strike trawling, warp and paravane cables or the netsonde (third wire) and are “then dragged underwater and drowned as they feed on factory discharge at the stern of the vessel” (Sullivan & Reid 2004: 62). For example, approximately 1,500 seabirds, including black-browed albatross, are killed annually by the local demersal trawling fleet around the Falkland Islands (Sullivan & Reid 2004). Given the remoteness and depth of the Southern Ocean, the environmental impacts caused by bottom trawling on benthos and fish spawning grounds are largely unknown (CCAMLR 2002a; Gianni 2004b; Kock 2001). However, the effects are likely to be long-lasting given the fragility of these communities, and CCAMLR members have prohibited the use of bottom trawls in some fisheries to minimise trawling impacts.

Longlining is a highly efficient and targeted method used to harvest toothfish species (Gianni 2004b). It also has an impact on non-target species and benthic communities when hooks are dragged across the seabed (Respondent 68). Most notably, longlining provides food (bait and discarded bycatch and offal) to non-target species such as seabirds, penguins, seals, non-target fish (including skates and rays) and other marine life, and they are subsequently killed when they strike at baited hooks (see Delord *et al.* 2005; Kock *et al.* in press). Lost and broken lines (from longlines and trawl nets) can also entangle fish, seabirds and marine mammals, and discarded bands from bait boxes collar marine mammals. In addition, discharged fish offal can cause population increases in some seabird populations and dependency on this food source.

In particular, the *ad hoc* WG-IMAG (CCAMLR 2002e) record that seabird bycatch due to IUU fishing in the Convention Area from 1996 to 2002 was between 278,400 and 700,200 birds as detailed in Table 5.4.¹⁷⁶ In the 2004/05 fishing season, 4,415 seabirds were taken in the unregulated fishery in the Convention Area (CCAMLR 2005d, f).

Table 5.4: Estimated potential seabird bycatch associated with IUU fishing for Patagonian toothfish in the Convention Area 1996 to 2002

	Year	Lower-level estimate*		Higher-level estimate*	
Total	1996	37,100	49,700	67,100	90,000
	1997	59,700	79,800	107,700	144,600
	1998	32,700	43,700	60,700	81,600
	1999	32,400	43,400	64,500	86,600
	2000	34,600	42,200	71,500	96,000
	2001	43,400	58,000	80,500	108,000
	2002	38,500	51,500	69,600	93,400
	Overall total	278,400	372,300	521,600	700,200

* Rounded to the nearest thousand
Adapted from: CCAMLR (2002e: 9)

¹⁷⁶ Approximately 144,000 albatrosses, 24,000 giant petrels and 378,000 white-chinned petrels may have been killed by IUU fishing (CCAMLR 2002e).

The extent of non-target bycatch in the toothfish longline fisheries has increasingly concerned fishing scientists, managers and conservationists.¹⁷⁷ For example, an Australian ornithologist, Nigel Brothers, was the first to calculate the threat of longlining (those not using mitigation devices and/or techniques) on seabirds in 1991, and he estimated 44,000 albatrosses were taken annually as bycatch in longline fishing operations in the Southern Ocean (Brothers 1991). The International Union for the Conservation of Nature (IUCN) also passed Resolution CGR1.69 on the Incidental Mortality of Seabirds in Longline Fisheries in 1996 and noted that “at least 13 species of seabirds, including albatrosses (family *Diomedidae*), and petrels and shearwaters (family *Procellariidae*), are suffering significant incidental mortality by being hooked and drowned within longline fisheries” (IUCN 1996: no page); it is a concern that CCAMLR members acknowledge (CCAMLR 2003a, c).¹⁷⁸

However, divergence in the *Patagonian Toothfish Network* exists between licensed and illegal longline fishing mortality (Respondent 14). For example, licensed fishers operating around South Georgia “caught a small number of seabirds while harvesting ... Patagonian toothfish in 2001” (Respondent 12) whereas the IUU fleet, which uses no longline mitigation measures, caught thousands of birds over the same period (CCAMLR 2002e). This example illustrates that the problem is “not longlining fishing *per se*, but rather the lack of mitigation measures being used by illegal fishers who work with longlines” (Fallon & Kriwoken 2004: 234-235). As such, licensed fishers support CCAMLR Conservation Measure 29/XIX (now 25-02) mobilised by CCAMLR members in 1991/92 to minimise seabird mortality from longline fishing in the regulated fisheries located primarily in the Indian Ocean (including setting lines deep underwater or at night, thawing bait, adding weight to lines to speed up sinking rates, using smart hooks, or flying streamers on tori lines to scare birds off baits, disguising baits with dye, and holding fish offal on board and/or discarding fish offal discreetly) (see CCAMLR 2002d; 2003c; Delord *et al.* 2005; Robertson 2001) (Table 3.2).¹⁷⁹

In addition, the FAO adopted the *International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries* (IPOA-Seabirds) in 1999 and calls on States to assess and monitor the extent of the problem and to adopt national plans to reduce incidental catch resulting from fishing in national maritime waters and on the high seas, taking into account experience with mitigation measures acquired in the RFMOs (FAO 1999b). Many States have also introduced measures through national actor-networks, in

¹⁷⁷ See, for example: AAD (2005d); Agnew (2000); Alexander *et al.* 1(997); ASOC (1998; 1999); Birdlife International (2002a); Croxall & Gales (1998); Delord *et al.* (2005); Gianni (2004a, b); Greenpeace (2000a, c); Haward *et al.* (1998); ISOFISH (2002a); Kimbal (2003; 2004); Knowler (2005); Kock (2001); Ryan & Watkins (2000); Tuck *et al.* (2003); Waterhouse (2001).

¹⁷⁸ The IUCN (2000) classifies albatrosses as “globally threatened.” Of the 20 species of albatross known to be killed by longlines in the Convention Area, at least two are “critically endangered” (the Amsterdam and Chatham albatrosses), with the remaining 18 species (including the wandering albatross, black-browed albatrosses and white-chinned petrels) either “endangered”, “vulnerable” or “near threatened” (see CCAMLR 2003a, c; Croxall & Gales 1998; Ryan & Watkins 2000).

¹⁷⁹ Post-capture handling and returning live bycatch to the ocean can also reduce bycatch fatalities.

the form of texts, technologies and performances, to protect bycatch species (see Fallon & Kriwoken 2004). For example, longlining was listed by the Australian Government in 1996 as a key threatening process under the *Endangered Species Protection Act 1992* (now the EPBC Act) and has since been considered under the *Threat Abatement Plan for the Incidental Catch (or Bycatch) of Seabirds during Oceanic Longline Fishing Operations* with the objective of reducing bycatch in all Australian fishing zones (Australia 1998a). Longlining for Patagonian toothfish in Australian maritime waters has also been prohibited, AFMA fishery managers have developed a number of fishery *Bycatch Action Plans* to reduce incidental bycatch mortality associated with specific industry operations, and *Australia's Ocean Policy* (Australia 1998b, c) targets IUU fishing and commits the Australian Government to pursuing illegal fishing in the Convention Area and adjacent waters through CCAMLR and other fora.

5.3 Dilemmas in stopping IUU fishing

5.3.1 International concern

CCAMLR members and States face many dilemmas in their attempts to stop IUU fishing activities, among them difficulties in policing the activities of highly organised and wealthy fishing syndicates. Despite the problems in assessing these activities and the debate over the accuracy of different estimates of IUU fishing, and the threats with which state actors contend, IUU fishing is cited as the most significant threat to the toothfish fisheries.¹⁸⁰ For example, Kock (2001) claims that IUU fishing undermines fisheries data on which to perform biological and economic assessments in order to adopt sustainable harvest levels. It also leads to excessive catches, disregard for restrictions, and dependent or associated species such as seabirds being severely affected. In addition, the opportunities for licensed fishers are removed, and incentives for these fishers to invest in adequate monitoring technologies are undermined. For Dodds (2000), IUU fishing also reveals that States and/or CCAMLR are unable to prevent IUU fishing, that regulation requires a range of state and non-state actor-networks to act cohesively, and that fishing operators are often reluctant to accept these regulations. In addition, media and environmental groups may unduly focus on single incidents, use provocative terminology (like piracy), and launch campaigns against organisations such as CCAMLR which tests their public credibility. The pressures of IUU fishing are also not felt immediately and a lag of approximately 10 years occurs before environmental impacts show up in the toothfish fisheries (Respondents 26, 36 and 68). Therefore,

¹⁸⁰ See, for example: AAD (2004b; 2005d); AFMA (2005e); Agnew (2000); Agnew & Barnes (2004); ASOC (1999; 2002a, c, e; 2004d); Australia (2003b, c; 2004f, g, h; 2005a, b, c, d, e, f, g); Balton (2004); Bialek (2003); Clark & Hemmings (2001); Constable (2002); Cox (2003); Croxall & Nicols (2004); Exel (2004a, b, c); Fallon & Kriwoken (2004); Fallon & Stratford (2003a, b); *Fishing News International* (1999); Gianni (2004); Gianni & Simpson (2005); Kaye (1998); HSTF (2006); Kirkwood & Agnew (2004); Kock *et al.* (in press); Lack & Sant (2001); Lugten (1997); Miller *et al.* (2004); Molenaar (2003; 2004); NET (2004a, c); OECD (2003a; 2004a, b); Rigg (2004); Sabourenkov & Miller (2004); Sabourenkov & Appleyard (2005); Stokke & Vidas (2004); Vidas (2000).

fishery managers are only now seeing the effects of past activities, and the impacts of current activities may not become evident for up to 10 years. Despite this lag, many management decisions made in terms of setting TACs or developing conservation measures to conserve fish stocks are based upon what is *currently* happening to the stocks (see Sabourenkov & Appleyard 2005).

At interview, 64 respondents in this study advance 16 key pressures impacting upon the toothfish fisheries (Figure 5.6). Collectively, they form a *Social Research Sub-network*, and by associating with me they have extended their connections in the *Patagonian Toothfish Network* in an effort to shape the conduct of others. Although this research sub-network is *punctuated* by the dissertation into the wider actor-network, the respondents can never *see* the whole picture because they form only one cluster in a heterogeneous group of actor-networks. Nonetheless, 95 per cent of respondents state that IUU fishing is the single most important activity threatening the toothfish fisheries, and 89 per cent identify the urgent need to ensure sustainable toothfish fisheries. Sixty-nine per cent of respondents also note other significant problems in the fishery, including incidental mortality of bycatch species and other environmental damage caused by fishing activities.¹⁸¹ They accept the OPP that IUU fishing is problematic and sustainable fishery outcomes are needed. These pressures are examined throughout the following chapters of this dissertation.

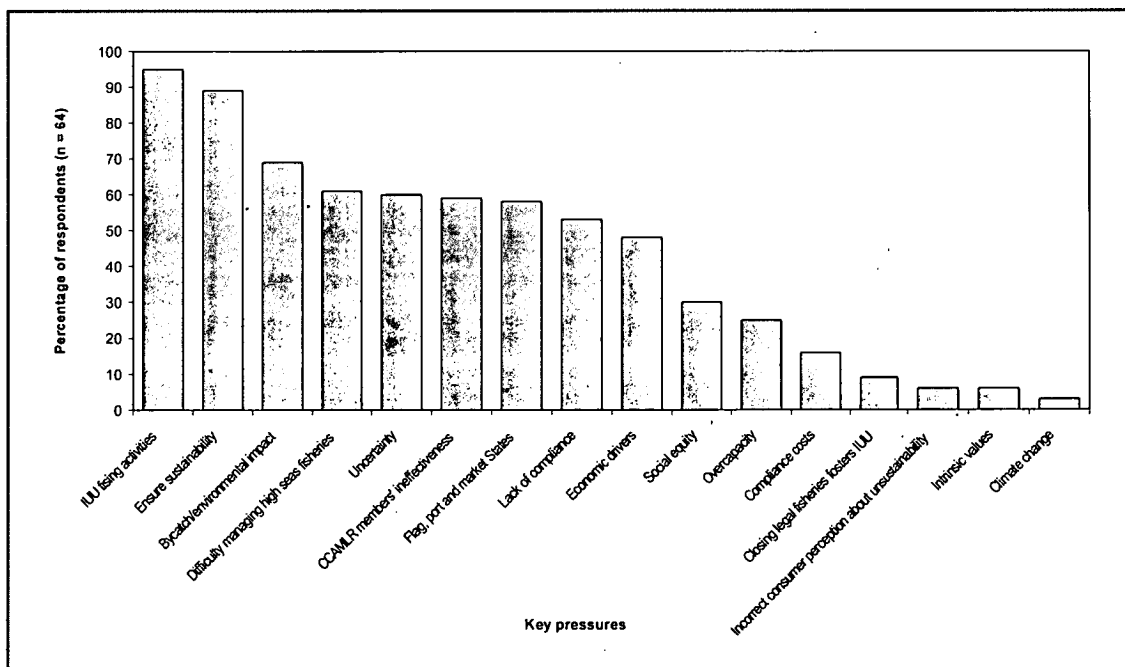


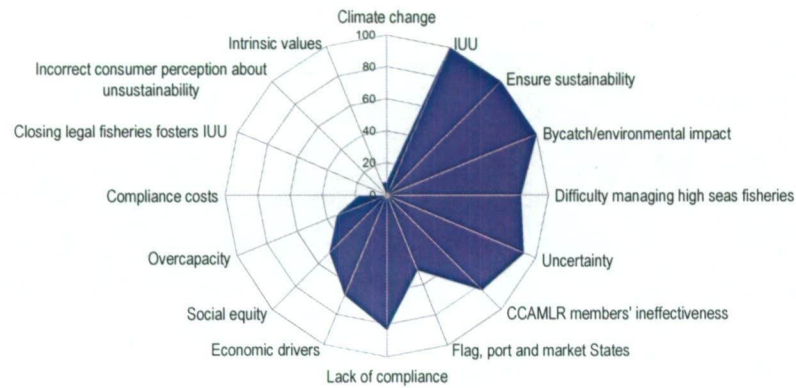
Figure 5.6: Key pressures impacting upon the toothfish fisheries (n = 64)

¹⁸¹ Reducing bycatch and other environmental damage caused by fishing activities was unanimously important to scientists and researchers and important to approximately two-thirds of other respondents.

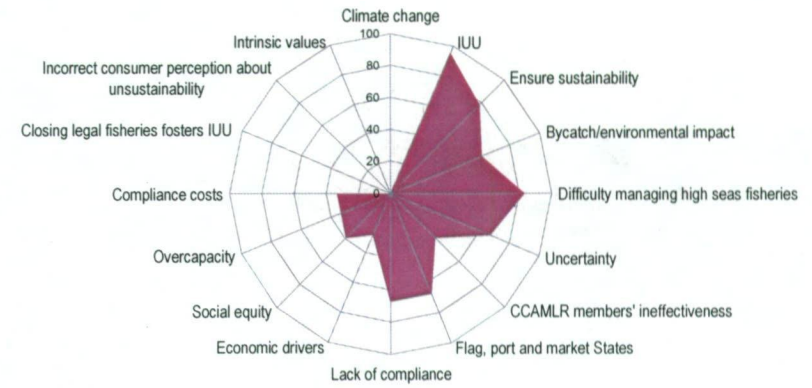
Figures 5.7 and 5.8 present a series of radar graphs and radar graph overlays that unpack the key pressures advanced by respondents in the four key actor-network categories: (1) scientists and researchers; (2) government officials and fishery managers; (3) NGO representatives and members of the community; and (4) fishers and industry operators (Section 2.3.3). This new method of approach has been developed to present the data in an innovative way. The radar graphs provide powerful visual summaries of the complex key informant findings in a simple graphic so as to identify, predict and assign relative significance to the issues raised by the respondents. I derived the radar graphs by condensing the thematic data and transforming the themes into percentage data, and then transforming the percentage data into the graphic form (also in percentage) for each actor-network category. The actor-network categories are then superimposed in the overlays to highlight confirming issues raised by the respondents, disconfirming outliers that draw out dissident views, or hidden issues that deepen the analysis and contribute to productive questions in the Patagonian toothfish management and conservation debate (see Patton 1990; 2001) (Appendix B). When referring to percentage data in the following discussions, my intention is to highlight key issues, pressures or actions rather than implying a formulation of generalities or representing the views of all actors with an interest in the debate. This approach does not affect my hope that the radar graph findings will provide insight and understanding to the investigation.

The radar graphs are *immutable mobiles* that link the data but also distant actor-networks in the *Patagonian Toothfish Network* (see Featherstone & Burrows 1995; Inkinen 2001; Latour 1987; 1990; Murdoch 1997a; Tatnall & Gilding 1999) and together with the text, they quickly disseminate the findings of this study (Section 2.2.3). For example, IUU fishing and resource sustainability are key issues raised by all the respondents. However, difficulties with regard to managing the high seas fisheries and conducting compliance activities are raised mainly by scientists, researchers, officials and fishery managers, but only a few NGO representatives and even fewer fishers and industry operators considered these points. Then again, only fishers and industry operators were concerned that closing fisheries to licensed fishers potentially provides open-access to IUU operators because the *eyes and ears* are removed from the distant fishing grounds. Furthermore, the radar graphs reveal otherwise hidden issues including the need to consider the intrinsic value of the Patagonian toothfish and Southern Ocean ecosystem in decision-making and the unknown consequences of climatic and oceanographic changes on Patagonian toothfish stocks; issues that respondents largely overlooked.

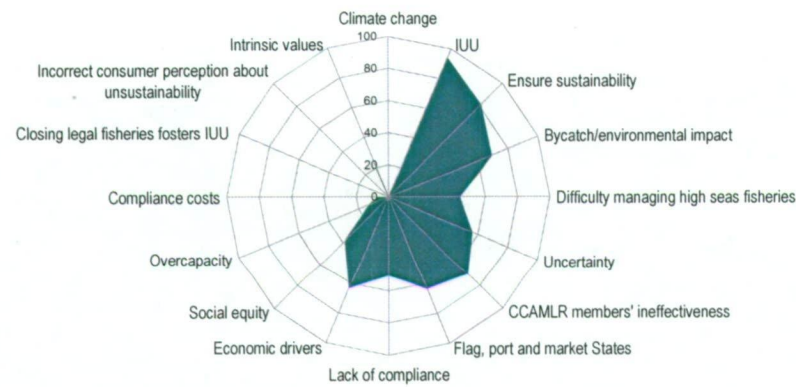
Scientists and researchers (n = 12)



Officials and fishery managers (n = 18)



NGOs and the general community (n = 16)



Fishers and industry operators (n = 18)

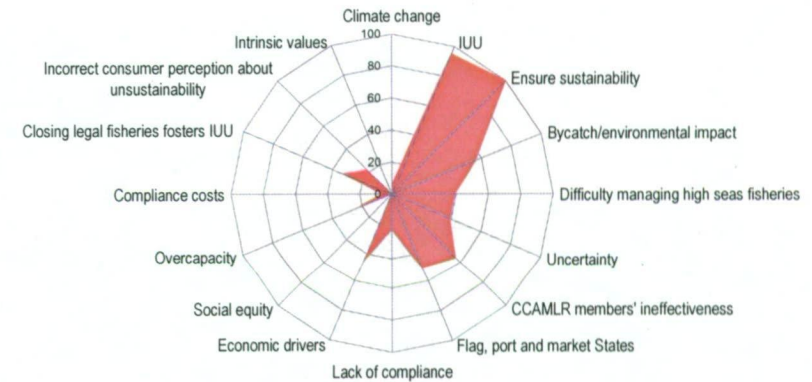


Figure 5.7: Key pressures impacting upon the fishery for each actor-network category (percentage of respondents per actor-network category)

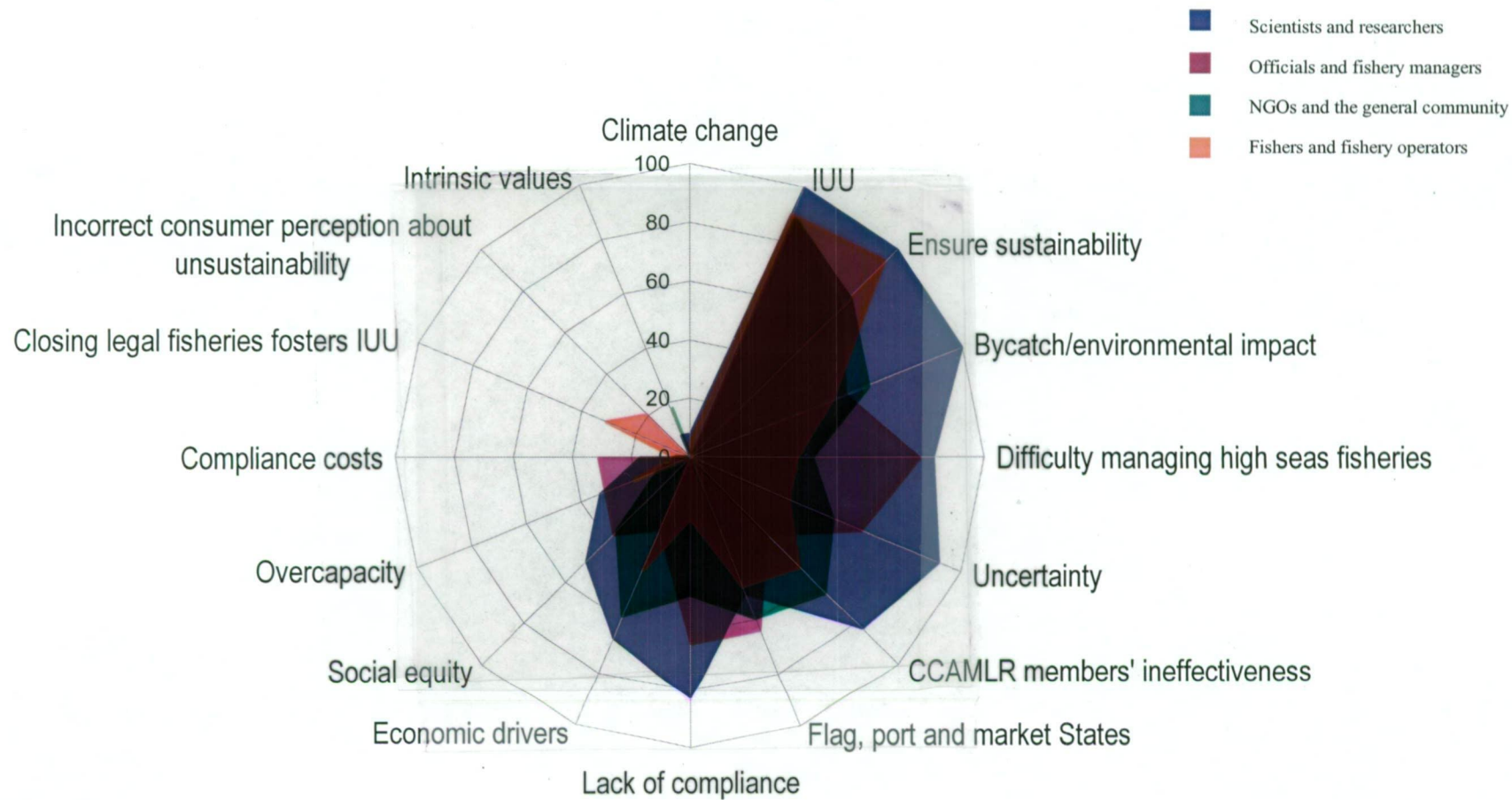


Figure 5.8: Overlays of the key pressures impacting upon the fishery for each actor-network category (percentage of respondents per actor-network category)

Scientists and researchers (with possibly the least commercially vested interest in the fishery) consider the greatest number of key pressures, followed by government officials and fishery managers, then NGO representatives and members of the community, and fishers and industry operators (with possibly the most commercially vested interest in the fishery). Scientists and researchers unanimously identify IUU fishing as the paramount pressure and the other actor-networks hold a similar view. For example, Respondent 2 suggests that IUU activities proliferate when “people can make money quickly with very little risk, particularly on the high seas where it is difficult to monitor remote fishing activities.” For Respondent 53, IUU activities are fuelled by the “explosive combination ... of high prices paid for toothfish in the main consumer countries from the northern hemisphere and the existence of many traditional fishery nations (like Spain) that don’t have fish [to catch].” Respondents 31 and 37 also point out that IUU fishing is triggered by the difficulties that national authorities face when needing to manage “the straddling and migratory nature of the fishery” in a cooperative way with other States. Finally, Respondent 18 states there is “no doubt that there are far more IUU fishing activities in the Southern Ocean than [we] are aware of ... and within CCAMLR, there are members who have been accused of IUU fishing or having some part in IUU activities.”

5.3.2 Dynamic, complex and multifaceted problem

According to ASOC (2002a) and ISOFISH (2002a), IUU fishing for Patagonian toothfish compromises the effectiveness of CCAMLR conservation measures and is allegedly conducted at a scale that threatens the sustainability of regulated fisheries and the survival of seabirds. There is also evidence that vessels registered by CCAMLR Contracting Parties (including Argentina, Norway and Chile) have violated CCAMLR conservation measures for toothfish (Dodds 2000). These complex management arrangements together with the uncertainty about the level of IUU catch has led to CCAMLR members being criticised for allocating quotas for toothfish with rational use intent and without basing the quotas on reliable catch information (Greenpeace 2000a, b). Conservation groups have also argued that this situation contradicts the ecosystem approach required by Article II and the precautionary principle that has been incorporated into CCAMLR fisheries management decisions. Moreover, although a number of CCAMLR members who were previously seen as being major toothfish poachers (including Argentina, Chile and Spain) are now controlling such fishing activities in their national waters, the beneficiaries of continuing poaching operations may still be from these States.

Ultimately, IUU fishing is a dynamic, complex, and multifaceted problem and no single management strategy is sufficient to curb these activities (Balton 2004; Escobar 2004; OECD 2004a; Stokke & Vidas 2004; Wynhoven 2004). In this light, 61 per cent of respondents (generally scientists, researchers, officials and fishery managers) consider that the difficult management of toothfish stocks found on the high seas and the ease

with which IUU fishing is undertaken in these waters are particularly problematic.¹⁸² For example, Respondent 49 states there are no formal management arrangements in place other than those in contravention of the broader responsibilities of States under LOSC. In this respect, LOSC establishes a general obligation on all States to cooperate in the conservation and management of the living resources of the high seas (Friedheim; Hayashi 1999; Stokke 1999). States whose nationals exploit identical living resources or different living resources in the same area have an obligation to enter into negotiations with a view to taking the measures necessary for the conservation of the living resources. To this end, they are required, as appropriate, to cooperate in the establishment of sub-regional and regional RFMOs. In addition, all States have the duty to take, or to cooperate with other States in taking, measures necessary for the compliance by their respective nationals with the regime for conservation and management of the living resources of the high seas (LOSC 1982 Articles 117 and 118). However, according to Greenpeace Australia Pacific (2004), IUU fishers exploit three loopholes in LOSC including one surrounding the authority of flag States when they fly their flags of non-compliance and fail to implement their international obligations. In addition, IUU fishers exploit the freedom of the high seas where unregulated use of common toothfish resource leads to over-exploitation and mutual loss, whichacerbates the Tragedy of the Commons. IUU fishers also exploit non-signatory exemptions where States are only bound by treaties (including the Convention on the Conservation of Antarctic Marine Living Resources) to which they consent and are otherwise beyond the reach of sanctions. Ultimately, IUU fishing has not been significantly reduced by LOSC, the UN Fish Stocks Agreement, IPOA-IUU or the Compliance Agreement. In addition, those involved in IUU activities are constantly changing and States may be unaware that their nationals or vessels are involved in the IUU toothfish industry (Section 3.4.5).

Problems associated with IUU fishers exploiting flag State authority and loopholes in domestic legislation are typified by the following example. At the height of IUU fishing in 1997, the Australian Government instructed the Royal Australian Navy (RAN) to patrol the HIMI fishing zone following reports of IUU fishers in the region near the HIMI. *HMAS ANZAC* arrested two vessels – the *Salvora*, registered in Belize, and the *Aliza Glacial* that had been registered in Panama, but was then registered in Argentina the week previously (Australia 1998d; Fallon & Kriwoken 2004; James 1998; Montgomery 1998a, b). The arrest of the crew of the *Aliza Glacial*, in particular, highlights how complex international corporate arrangements and loopholes in domestic legislation can assist IUU operators (see Fallon & Kriwoken 2004: 238-239). The *Aliza Glacial*, commanded by an Argentine captain, was initially escorted back to Perth in Australia and subsequently had its cargo of 21 metric tonnes of Patagonian toothfish (worth approximately US\$84,000) impounded by the Australian authorities (Dodds

¹⁸² Eighty-three per cent of scientists and officials identify the difficulty of managing toothfish resources on the high seas compared to 44 per cent of NGO representatives and 39 per cent of fishers. .

2000). The captain of the vessel and others faced fines under the Australian *Fisheries Management Act 1991* of up to US\$189,000 and forfeiture of boat, gear and catch.¹⁸³

Here, the Norwegian Bergensbanken Bank used the Australian *Admiralty Act 1988* to secure the vessel's release (Australia 1988). The Australian *Admiralty Act 1988* provided the comprehensive jurisdictional framework within which the civil Admiralty Law is administered (Australia 1988; Hetherington 1989; Street 1989). Under the Act, section 4(2), proprietary maritime claims are those "involving disputes over title to, or possession of a ship, mortgage claims, co-ownership disputes, claims to enforce statutory liens ... and associated claims to interest" (Hetherington 1989: 7). Disputes usually involve determining or enforcing claims to title or possession of the ship in question with the result that surrogate ship arrest is excluded.

Bergensbanken's action before the Australian Federal Court was triggered when the owner of *Aliza Glacial*, Ravenor Overseas Inc; defaulted on its interest payment and Bergensbanken served notice on the company's Norwegian agents, demanding full payment of the loan or forfeiture of the vessel (ISOFISH 1998b, e). The bank argued that, although Ravenor Overseas Inc. owned the vessel, the vessel had been bought from the Buenos Aires registered company Glacial S.A. Given that Bergensbanken had loaned Glacial S.A. US\$11 million to purchase the vessel, the bank argued that the subsequent purchase by Ravenor Overseas Inc. did not cancel the debt (Woolford 1998). In addition, given that Glacial S.A. was owned by the Norwegian parent company Glacial Holdings, Bergensbanken argued that all three companies were required to honour the loan agreement. The Australian Federal Court ruled in favour of Bergensbanken, concluding that the Bank could repossess the vessel. The court determined that since the Australian *Fisheries Act 1952*, and more recently the Australian *Fisheries Management Act 1991*, was silent on the issue of repossession of the vessel by a debtor, the *Admiralty Act 1988* would prevail (Australia 1983; 1991).

In addition, being unable to penalise or confiscate the *Aliza Glacial*, the Australian Government could not penalise the captain and fishing master of the *Aliza Glacial* as they failed to appear in the Australian Court in July 1998 to defend poaching charges, having fled the country. Although warrants for their arrests were issued, the court action was largely ineffective and extradition was not available since illegal fishing is not a serious offence under criminal law for which extradition does exist. The Australian Government has since recognised the problem and, through Part 6 of the *Fisheries Legislation Amendment Bill 1999*, amended the *Fisheries Management Act 1991* to give it precedence over the *Admiralty Act 1988* (AFFA 1999, Part 6; Australia 1983; 1991;

¹⁸³ According to Dodds (2000), 25 metric tonnes of toothfish (worth approximately US\$100,000) were confiscated from the *Salvora*. The *Salvora* was released on a US\$1.1 million bond. The more valuable *Aliza Glacial* remained in custody (Montgomery 1998a) and "the Australians told the owners of the ... *Aliza Glacial*, they could have it back for US\$9 million" (De Villiers 1997: no page).

1999b).¹⁸⁴ The case highlights that national laws and corporate arrangements can be manipulated by IUU operators to their own advantage; but also that States with similar laws need to review their domestic legislation to ensure it can not be used to *rescue* vessels arrested under national fisheries legislation.

In 2000 the IUCN World Conservation Congress held in Amman, Jordan also called on States and RFMOs to combat IUU Patagonian toothfish fishing by all practical means, including undertaking sea patrols, removing economic incentives that led to the re-flagging of vessels to non-CCAMLR members, adopting strict port and trade controls, and documenting and certifying international toothfish trade. If IUU fishers are able to fish with impunity, international governance of fishing by the legitimately licensed toothfish industry is utterly compromised in the process. For example, in June 2003 when an Australian/New Zealand-flagged longliner *Janas* was leaving the HIMI maritime zone, crew members encountered longline vessels fishing in the Convention Area and in FAO Statistical Area 57 adjacent to it (AAD 2003b; AFMA 2004a; Respondent 16). One vessel stopped the *Janas* from setting its fishing lines (an action that could be construed as a violation of international law if not vigilantism), and the aggressive actions of its crew contributed to the captain of the *Janas* deciding to return to port. Three days later, another Australian-flagged vessel *Southern Champion* sighted two longline vessels approximately 50 metres outside the HIMI maritime zone but still in an area closed to fishing inside the Convention Area (Respondent 12). Their captains took action to ensure the vessels were not recognised, blanking out or rendering invisible the vessels' port names, call signs and flags (AAD 2003b).

Other vessels sighted by licensed operators undertaking IUU operations include one that was eventually apprehended by French authorities in June 2004 illegally fishing around the Kerguelén Islands, and subsequently identified as the Honduran-flagged fishing vessel *Apache* (COLTO 2004c). Such examples underscore the point that IUU fishers challenge coastal States' sovereignty and national and international management and conservation measures because they fail to comply with the conservation measures and other terms and conditions established in the laws and regulations of coastal States in the Convention Area (LOSC 1982, Articles 61 to 64). Although IUU fishers have a common law right to engage in fishing on the high seas, they also fail to cooperate with other States in abiding by national measures to conserve marine living resources (LOSC 1982, Articles 116 to 119). These incidents also emphasise that IUU toothfish operators challenge moral and legal norms, not only with respect to the Patagonian toothfish, but also to licensed fishers, and to their own fishers who are required to ram legitimately licensed vessels as exemplified by the *Janas* case outlined above.

¹⁸⁴ Other amendments strengthen forfeiture provisions (AFFA 1999, Part 5) and double the penalties to reflect the high value of catches taken (AFFA 1999, Part 3).

5.3.3 The need for surveillance and compliance

Given that many thousands of metric tonnes of toothfish have been taken through IUU fishing, CCAMLR members and coastal States support strong surveillance and compliance measures to protect the fisheries. The arrest of numerous vessels' crews, the confiscation of vessels and fish catch, and the subsequent fines imposed on crews and fishing companies act as deterrents against IUU fishing. However, such arrests have only been made in respect of illegal fishing in national maritime zones within the Convention Area. The capacity of CCAMLR members or other States to arrest crew and seize vessels on the high seas in breach of CCAMLR measures or national laws remains to be tested in the courts. With this in mind, 53 per cent of respondents identify that the lack of effective and sustained compliance in the toothfish fisheries, particularly on the high seas, allows IUU fishing to flourish. Given that only 22 per cent of fishers and industry operators comment on this issue, they may be reticent to support compliance activities that might be directed towards containing their own activities.

More specifically, States with an interest in the toothfish fisheries have mobilised disciplinary power with varying success. They have collectively deployed seaborne surveillance and developed new and emerging technologies (such as the cVMS, airborne surveillance, over the horizon radar (OTHR), satellite imagery and all-weather imagery) to detect vessels in all weather conditions, stop IUU fishing activities and bring about interruptions to the *Dissident IUU Sub-network*. Some States have also come together as voluntary members of the informal International Network for the Cooperation and Coordination of Fisheries-Related Monitoring, Control and Surveillance (known as the *International MCS Network*) to cooperate, coordinate and share intelligence on national compliance efforts (FAO 2004a; HSTF 2006; MCS 2006; NOAA 2002; Trent *et al.* 2005).¹⁸⁵ These efforts have helped governmental agencies meet international and regional commitments in relation to LOSC and the IPOA-IUU.

Coastal States with toothfish fisheries in the Convention Area have also mobilised specific disciplinary measures in an attempt to stop IUU fishing. For example, the Australian Government's efforts at the national level include the implementation of the *2005 National Plan of Action to Prevent, Deter and Eliminate IUU Fishing* (NPOA-IUU) (Australian 2005c);¹⁸⁶ international actions such as *Operation Rushcutter* (the first armed civilian fisheries patrol of Australian waters, which concluded in May 2003) (ACS 2003; 2004c, e); and the current provision of nearly US\$68.9 million over two years in 2005/06 to fund the patrolling of the more hostile Antarctic seas (the specifically contracted 105-metre patrol vessel *Oceanic Viking* that has been armed) (AAD 2004c, e; Campbell 2004; Ellison & Macdonald 2004; Macdonald & Ellison

¹⁸⁵ Established in January 2000 in Santiago, Chile, the *International MCS Network* has some 50 members that include Australia, Canada, Chile, the EU, Japan, New Zealand, Norway and the United States.

¹⁸⁶ The NPOA-IUU closely follows the structure and measures of the IPOA-IUU and was developed through consultation with fisheries departments and agencies, toothfish fishers and NGOs.

2005b, c). Despite the considerable political commitments and efforts to protect Australia's Patagonian toothfish fisheries, the Australian Government have yet to make any significant reductions in IUU fishing effort in its maritime waters. Even so, the Australian Government remains committed to stopping IUU fishing activities and announced in the May 2005 Federal Budget that from 2006/07 to 2008/09, additional "supplementation" funding of over US\$7.5 million had been allocated to support ACS operations in "protecting Australia's Southern Ocean waters and resources" (Australia 2005a). A further US\$90 million was allocated to the ACS from 2006/07 to 2008/09 to "protect Australian sovereignty and environmental values in the Southern Ocean and the continued operation of a sustainable Australian fishing industry", and to provide a visible deterrent against illegal fishers accessing HIMI waters (Australia 2005a).¹⁸⁷

Despite the difficult tasks of enrolling and mobilising a patrol capability in terms of resources, training, safety and detecting IUU vessels, Respondent 27 states that Australian patrol operations have been successful in increasing cooperation and intelligence between States and maximising resources. For him, continuing patrol operations are important because if they are scaled-down, IUU operators are likely to return to previously targeted waters.¹⁸⁸ As noted, the ACS apprehended the Cambodian-flagged vessel *Taruman* and its Spanish master (and Chilean, Peruvian, Russian and Ukrainian crew) in September 2005 on suspicion of fishing illegally 130 metric tonnes of Patagonian toothfish in Australian maritime waters around Macquarie Island (*ABC NewsOnline* 2005a; *RIA Novosti* 2005) (Section 5.2.1) (Plate 5.1).



Plate 5.1: Australian patrol vessel *Oceanic Viking* stands by while the suspected illegal fishing vessel *Taruman* is boarded (© ACS)

¹⁸⁷ Given that the HIMI fishery has a production value of approximately US\$22.7 million per year (Respondent 12), the cost of protecting this fishery for the Australian Government is not insignificant. As well as protecting toothfish stocks *per se*, the Australian Government also protects other politically motivated values such as defending Australia's sovereign rights and international reputation.

¹⁸⁸ Australian authorities have arrested *South Tomi*, *Lena*, *Volga*, *Viara I*, *Maya V* and *Taruman*. For example, a court hearing related to the seizure and forfeiture of the *Volga* was finalised in 2005 with the High Court of Australia awarding costs against the owners (Olbers Co Ltd). The proceeds from the sale of the catch, US\$1.7 million, went to Consolidated Revenue and the vessel was disposed of (AFMA 2005b).

Australian authorities have also pursued the allegedly Togan-flagged fishing vessels *Hammer*¹⁸⁹ and *Sargo*¹⁹⁰ and the Japanese-flagged fishing vessels *Ryoan Maru 5*, *Ryoan Maru 1* and *Ryoan Maru 38*¹⁹¹ in 2005 to ascertain, without success, what fishing activities had been undertaken by their crews in the Convention Area near HIMI (AFMA 2005b; Australia 2005g; Macdonald & Ellison 2005a, c). Other fishing vessels flagged to non-CCAMLR States, including the Togan-flagged *Ross*¹⁹² and *Condor* and possibly the Georgian-flagged *Jian Yuan*,¹⁹³ *Kang Yuan*,¹⁹⁴ and *Koko*,¹⁹⁵ were recently sighted reportedly illegally fishing on the BANZARE Bank (CCAMLR Division 58.4.3b), which has been closed to fishing by CCAMLR members since February 2005 because the TAC for the 2004/05 fishing season had been reached (ABC 2005a; AFMA 2005b; Macdonald & Ellison 2005c). The Equatorial Guinea-flagged fishing vessels *Seastorm*¹⁹⁶ and *Red Lion 22*¹⁹⁷ were also respectively sighted near the Crozet Islands in July 2005 and on the Lena Bank in August 2005. These sightings highlight the persistence of IUU fishing, particularly by vessels using FOCs. In addition, the inability of Australia authorities (or CCAMLR members) to take effective action against these sightings further highlights the weakness of international efforts to stop IUU fishing on the high seas. In addition, diplomatic efforts to change the fishing practices of Togan and Georgian fishers is difficult because these States have loose government arrangements and their administrations are often corrupt (for example: the 5 February 2005 *coup d'etat* and Presidential uncertainty in Togo).

Enforcement efforts to protect the Kerguelén and Crozet Islands Patagonian toothfish fisheries by the French in their maritime waters have also become increasingly sophisticated. Directed by the Préfet de la Réunion based on Réunion Island, French authorities have committed US\$18.9 million per year to surveillance and enforcement activities (Respondent 58). Activities are conducted using collaborative (both funding and operations) civilian and military actions. Three navy vessels have been enrolled into the *French Toothfish Sub-network* for compliance operations and comprise two naval frigates and the patrol vessel *l'Albatros*. In addition, the Seychelles-flagged fishing vessel *Lince* was apprehended by French authorities using the naval frigate *Nivose* near Kerguelén Island in January 2003 and was subsequently convicted in the French courts of illegally fishing in French maritime waters (Appendix C).¹⁹⁸ The vessel has since

¹⁸⁹ Formally known as the *Carran*, the suspected IUU fishing vessel, *Hammer*, was sighted on the Elan Bank (CCAMLR Division 58.4.3a) 70 nautical miles from HIMI (see AFMA 2005b).

¹⁹⁰ Australian authorities sighted this vessel fishing outside the Convention Area (AFMA 2005b).

¹⁹¹ Three Japanese vessels were sighted north of the Convention Area on the high seas setting longlines close to the CCAMLR boundary where lines could drift into the Convention Area (Australia 2005g).

¹⁹² Suspected to be the IUU fishing vessel known as *Alos* and *Lena* (see AFMA 2005b).

¹⁹³ Australian authorities suspect this to be the IUU fishing vessel known as *Boston 1* (AFMA 2005b).

¹⁹⁴ Suspected to be the IUU fishing vessel known as *Champion* and *Champion 1* (see AFMA 2005b).

¹⁹⁵ Suspected to be the IUU fishing vessel known as *Austin* and *Austin 1* (see AFMA 2005b).

¹⁹⁶ Suspected to be the IUU fishing vessel known as *Mohicano*, *American Warrior* and *Christina Glacial* (see CCAMLR 2005j).

¹⁹⁷ Suspected to be the IUU fishing vessel known as *Lucky Star* (see CCAMLR 2005j).

¹⁹⁸ The Seychelles Government de-flagged the fishing vessel *Lince* in March 2003 (COLTO 2004b).

been confiscated by French authorities, renamed *Osiris* (COLTO 2004a), re-enrolled into the actor-network “to become a State vessel in charge of IUU enforcement” and has sophisticated radar satellite and a weapons capacity to detect and apprehend suspected IUU vessels (Respondent 58). Radar satellite surveillance has also been established by French authorities and they are considering the merits of using unmanned surveillance aircraft to monitor the fisheries when the technology becomes fully functional. These collaborative efforts have resulted in the arrest and confiscation of 23 IUU toothfish vessels by French authorities since 1997 (Respondent 58). In addition, the French Government sought the rejection of the Panamanian Government’s submissions to the International Tribunal for the Law of the Sea based in Hamburg, Germany, in the precedent-setting case in 2000 which related to the prompt release of the Panamanian-flagged vessel *Camouco*, suspected of illegally fishing for Patagonian toothfish around the Crozet Islands (ITLOS 2000a, b).

In *The “Camouco” Case*, French authorities arrested the *Camouco*, in 1999 after it was sighted illegally fishing around the Crozet Islands (ITLOS 2000a).¹⁹⁹ The French Court ordered that the release of the vessel was subject to a 20 million franc bond (approximately US\$3 million). However, the Panamanian Government objected and took the French Government to the International Tribunal for the Law of the Sea to decide the reasonableness of the bond demanded. Although the International Tribunal for the Law of the Sea was requested on behalf of Panama to order the prompt release of the *Camouco* and its master, the French Government requested that the Tribunal reject the Panamanian Government’s submissions (ITLOS 2000b). The International Tribunal for the Law of the Sea ruled in the Panamanian Government’s favour and ordered the prompt release of the *Camouco* and its master on the deposit of eight million francs (approximately US\$1.2 million) (ITLOS 2000a). The Tribunal stated that fines “must be reasonable” and could not be disproportionate to the offence or higher than the value of the vessel (ITLOS 2000b). However, the Panamanian Government became increasingly concerned that FOC vessels registered in their State were having undesirable political and public relations consequences (Molenaar 2002). Pressured by the Panamanian Government, the Spanish renamed the *Camouco*, the *Arvisa 1*, and re-flagged the vessel to Uruguay.²⁰⁰

Other States are also committed to monitoring their fisheries against IUU activities. For example, although SGSSI waters have not been affected by IUU fishers operating in recent years, the SGSSI Government “is constantly looking at new mechanisms to ensure effective surveillance, and United Kingdom authorities maintain patrolling operations in these waters” (Respondent 40). The SGSSI Government charters approximately 200 ocean patrol days per year from the Falkland Islands Government.

¹⁹⁹ See: Case No. 5: *The “Camouco” Case (Panama v. France)* (ITLOS 2000a, b).

²⁰⁰ See also: Case No. 8: *The “Grand Prince” Case (Belize v. France)* (ITLOS 2001) and Case No. 11: *The “Volga” Case (Russian Federation v. Australia)* (ITLOS 2002).

When the patrol vessels *Sigma* and *Dorada* are present during the Patagonian toothfish fishing season the crew also conducts both CCAMLR and SGSSI Government inspections. The vessels patrol British External Territorial waters all-year-round because “IUU fishers are less likely to access a fishery when other legitimate operators are present” (Respondent 40). In addition, the South African Patagonian toothfish fishery around PEMI has been opportunistically patrolled by patrol vessels and aircraft (Respondent 18). However, given the *serious* impact of IUU fishing on PEMI Patagonian toothfish stocks in the late-1990s, the South African Government acquired the 85-metre patrol vessel *Sarah Baartman* in early 2005 to patrol this fishery. In addition, the New Zealand Government has committed funds to conduct monitoring and surveillance activities for the Ross Sea region (Respondent 34). Orion overflights are conducted throughout the fishing season and the military have been contracted to conduct patrol vessel surveillance activities. These efforts have not detected any IUU fishers in the Ross Sea to date.

NGOs have also been influential and increased their power in the *Patagonian Toothfish Network* by mobilising intermediary actor-networks to conduct surveillance activities. For example, the Australian based International Southern Oceans Longline Fisheries Information Clearing House (ISOFISH) supported and encouraged Greenpeace and French authorities (habitual antagonists) to work collaboratively “with the view to exploring areas of possible mutual assistance and cooperation” (see ISOFISH 1999c: 3). Greenpeace enrolled the campaign vessel *Arctic Sunrise* and deployed it to the Southern Ocean to document and expose alleged illegal fishing activities for Patagonian toothfish (Greenpeace 1999). With the help of technical support provided by ISOFISH, Greenpeace discovered an unmarked fishing vessel operating in French territorial waters that was later identified as the Belize-flagged fishing vessel *Salvora* which was found guilty of fishing in Australian maritime waters in 1997 (Fallon & Kriwoken 2004). For Respondent 41, when the *Arctic Sunrise* chased *Salvora* for 13 days from the Kerguelén Islands to Mauritius, this was the first *hot pursuit* of an IUU fishing vessel. After Greenpeace tracked *Salvora* to Mauritius, a local inspection team discovered suspected illegally-caught toothfish onboard and stated that the cargo could not be unloaded. During this period, licensed fishers were not involved in policing the fishery or discouraging IUU fishers from operating. However, as resource stocks became scarcer and their viability questioned, fishers started conducting their own surveillance and pursuit activities.

In August 2003, the efforts of toothfish fishing industry members to mobilise intermediary actor-networks and disseminate information to the media and national government authorities aided in the successful chase of the illegal Uruguayan-flagged longliner *Viarsa 1* and arrest of the crew by Australian and South African authorities after it was sighted (by these authorities) fishing in HIMI waters (see AAD 2004b). After a three-week chase (by Australian and South African authorities) over 4,000

nautical miles, Australian Fisheries and Customs officers boarded the vessel in the mid-Atlantic, almost 2,000 nautical miles south-west of Cape Town, South Africa. Operators of *Viarsa 1*, the Uruguayan master and its Spanish and Chilean crew faced charges of illegal fishing in Fremantle, Australia under the *Australian Fisheries Management Act 1991* after 97 metric tonnes of toothfish was found onboard (Macdonald 2003; *News24.com* 2003b). At time of writing, this case is *sub judice* and being tested in the Western Australian Courts. After a nine-week trial, charges laid against five crew members were discharged after the jury failed to reach a verdict in late 2004 (AFMA 2005b).²⁰¹ A second trial began in September 2005 and, in November 2005, the master and his crew were unanimously cleared of poaching Australian fish stocks because they successfully argued that they were merely passing through the Australian HIMI as legally permitted (see AAP 2005; *ABC NewsOnline* 2005b; Darby 2005). With the cost of the *hot pursuit* of these IUU fishers and their subsequent prosecution by the Australian Government being estimated at least US\$3.4 million, Banks (2005: no page) describes the acquittals as “an embarrassing setback” for the Australian Government and predicts the continuation of Federal Court action. Once again, IUU operators have manipulated national laws and international arrangements to their own advantage.

5.4 IUU market activities

Always oriented towards export trade, the internationalised toothfish economy has emerged over the past decade to form a *Toothfish Market Sub-network* that is embodied by an interconnected process of global governance, harvesting, distribution, exchange and consumption that acts at a distance. Given that producers and traders act trans-nationally for personal gain, operate both legitimately and illegally, are highly mobile and generally seek to remain hidden from those not purchasing their products, they too can form part of the leaky and unstable *Dissident IUU Sub-network*. In this respect, the Patagonian toothfish transforms itself from a marine living creature to a marine living resource and then a commodity by disentangling itself from its natural ecosystem and moving (or transforming) from the ocean to the harvester-producer and then on to the producer-seller and customer-buyer (see Callon 2002; Fox 1999; Goodman 1999; Marsden 2000). In a chain of translation, the toothfish reconstitutes itself as a toothfish product and its trade contributes to economic forms of governance, and helps set the character of individual and collective actions in the toothfish marketplace.

In this light, the Patagonian toothfish is a relatively valuable species that attracts high prices (Ashford *et al.* 2005; Hatcher 2004; Miller *et al.* 2004), and it is estimated that approximately 50 States are involved in the trade of toothfish products (see Greenpeace 2002; Miller 2002; NET 2004c; Willock 2002).²⁰² Indeed, such is the demand that over

²⁰¹ The Uruguayan owners of the *Viarsa 1* intend to challenge the forfeiture and the Australian Government may refer this matter to the International Tribunal for the Law of the Sea (AFMA 2005b).

²⁰² There is uncertainty regarding which States are involved in the toothfish trade. Miller (2002) estimates that 40 States are involved; whereas Greenpeace (2002) puts this estimate at 57 States.

90 per cent of toothfish products enter into international trade (TRAFFIC 2001b; 2003b; TRAFFIC and WWF 2002) supplied by Argentina, Australia, Chile, France, New Zealand, South Africa and the United Kingdom (Sabourenkov and Miller 2004).²⁰³ Chile is the world's largest producer and over 60 per cent of Chilean toothfish landings are directed to processing and export markets (Catarci 2004; González *et al.* 2001; TRAFFIC 2003b). A selection of States and traders that have traded toothfish products is detailed in Appendix F. Collectively; these market-based actor-networks define themselves by means of the key intermediary – money – which they put into circulation.

Over the 1990s, Patagonian toothfish became a popular seafood dish in the United States, Japan, Europe and Canada, and it appears on the menus of many exclusive restaurants (Baker 2004; Lewy 2004; Schulman 2003; Tuck *et al.* 2003).²⁰⁴ Since early 2000, Asian and South American markets (including those of China, Indonesia and Singapore) have increased in size (Fundación Chile 2004; Sumaila 2004). In the United States, toothfish products sold in 2003 totalled US\$103 million, with approximately 50 to 60 dealers supplying fish products, and the restaurant industry accounted for approximately 70 per cent of all toothfish sales (see FMNH 2004; Helvarg 2004; Hutchinson 2004). Restaurant sales have become so popular that, in 2001, Patagonian toothfish was named *Bon Appetit* Magazine's "Dish of the Year" (Martosko; 2002; *The Associated Press* 2002).²⁰⁵ Patagonian toothfish is highly sought after because it has replaced other severely depleted species (like the Northern Cod) in the marketplace, and because it has few bones, firm musculature and oil-rich white flesh that flakes into bite-sized pieces (Cascorbi 2002; Fallon & Kriwoken 2004; FAO 2000; Lack 2001; Lack & Sant 2001). Toothfish is available all-year-round, but is generally frozen at-sea and sold as a heterogeneous product that includes frozen whole fish (headed and gutted), fillets, fins and cheeks, although fresh fillets are available when in season (Smith 2004).

Since the late-1990s, the price of toothfish has more than doubled (Lery *et al.* 1999; Lewy 2004; Respondent 43; Sumaila 2004), and in 2005 it sold for US\$10,000 per metric tonne (Choquet 2003; Respondents 2 and 69), from US\$7 to US\$35 per kilogram at American retail outlets and as much as US\$100 per kilogram for sashimi-grade fish or cheek-meat (see *AlwaysFreshFish.com*. 2005; Duncan 2002; Kock 2001; ISOFISH 2002a; Montgomery 2002; *The New Zealand Herald.com* 2004; Sabourenkov & Miller 2004). A single sashimi-grade toothfish can fetch up to US\$1,000 per fish (Perry 1998; Schulman 2003) although some commentators consider that the higher prices may only be reflected for fillet or cheek-meat products (Respondent 49). In Australia, industry

²⁰³ Non-Contracting CCAMLR Parties supply the remaining products (Sabourenkov & Miller 2004).

²⁰⁴ Others consider Japan as the largest toothfish importer in terms of value (Catarci 2004; González *et al.* 2001) followed by the United States, the United Kingdom, Canada and Asian countries (ASOC 2002d; Austral Fisheries Pty Ltd 2002; *Canada News Wire* 2003; Mascoli 2004; Pacific Seafood 2004).

²⁰⁵ Cooking includes broiling, grilling, sautéing, baking or blackening. Nutritional data for 100 grams of edible weight include: calories – 184.0 kcal; protein – 13.2g; total lipid (fat) – 14.2g; Omega-3 fatty acids – 1.3g (*AlwaysFreshFish.com*. 2005; Harlow 2004; Simply Seafood Superstore 2005).

operators indicate that in 2005 it sold for approximately US\$11 per kilogram for processed fish and US\$21 a plate at Australian restaurants (Australia 2005b, e). In New York, restaurants charge almost US\$30 a plate (FMNH 2004).²⁰⁶

The sale of toothfish products to over 50 States highlights the international character of this industry sector (see Willock 2002). Bush (2002: 129) considers “that the Antarctic may well attract the attention of large corporations over which, by virtue of economic globalisation, individual States may have only limited control.”²⁰⁷ In this context, large-scale IUU trading is a manifestation of the power of private commercial actor-networks. IUU traders are like IUU fishers, they mutate the *Toothfish Market Sub-network* by promoting their own self-interests at the expense of other actors and networks. They are also prepared to risk assets for high returns in terms of fishing and various trade activities, and trade figures suggest that their activities account for approximately 50 per cent of the market (TRAFFIC 2001b).²⁰⁸ Trade estimates of IUU toothfish products are generally consistent with CCAMLR’s estimates and they appear to indicate a significant drop in IUU catch from its height in 1997 (TRAFFIC 2001b). However, trade figures are criticised because IUU toothfish landings may be traded under many names and it is unclear whether the figures relate to product weight or green weight.²⁰⁹

Importantly, traders can choose to sell legitimately or illegally caught toothfish products and by 2001 approximately 11 States were involved in IUU toothfish trade (Cascorbi 2002; Lack & Sant 2001). Until this time, IUU trade was apparently dominated by Spanish-owned fishing companies that employed vessels registered through FOC States such as Panama, Vanuatu and Belize (TRAFFIC 2001b). Norwegian and Chilean operators are also alleged to have been heavily involved in the illegal trade (ISOFISH 1998a, b, c, d, 1999b; 2000). The ports of Durban (South Africa), Montevideo (Uruguay), Port Louis (Mauritius), Vigo (Spain), Walvis Bay (Namibia), and Tanjon Priok (Indonesia), and the Port of Singapore, have allegedly received IUU catch in recent years (Austral Fisheries Pty Ltd 2002; ISOFISH 1998b, c; Greenpeace Australia Pacific 2004; TRAFFIC 2001b). Except for Indonesia and Singapore, all are members of, or acceding States to, the Convention on the Conservation of Antarctic Marine Living Resources.²¹⁰ Toothfish products are laundered through importing States to other

²⁰⁶ Although Australia is a major harvesting nation, only small quantities of toothfish enter the Australian market because restaurateurs are unwilling to purchase frozen toothfish products (Respondent 16).

²⁰⁷ Economic globalisation is driven by complex socio-spatial relations and facilitates accelerated global movements of market transactions, goods and services, money and resources, people, ideas or communications by mobilising inhuman actor-networks such as infrastructure, communication technologies, laws and regulations, and other norms (see Dicken 2004; Held *et al.* 1999; de Sousa Santos 2004).

²⁰⁸ The United States Department of Commerce and United States Department State (2002) estimate that legitimate imports into the United States account for about 15 to 20 per cent of the toothfish catch.

²⁰⁹ Green weight (the standard scientific unit) refers to total live fish weight. Basic product weight is headed and gutted fish before transport and product weight is processed fish that is ready for the domestic market. Trade weight statistics are converted back to green weight to calculate total estimated catches.

²¹⁰ Indonesia and Singapore have been invited (as non-Contracting Parties) to join CCAMLR.

markets such as Canada (a CCAMLR Contracting Party that has not implemented the CDS) and re-exported into other States such as the United States (Sabourenkov & Miller 2004).

IUU catch landings have, at times, resulted in a marked drop in market prices for toothfish to the detriment of legal operators (Respondents 12 and 43). For example, when IUU fishing was at its height in 1997, the price of toothfish dropped to US\$2.40 per kilogram and legitimately caught fish was stored until the price recovered (Australia 2005b). The low price of toothfish at that time created additional demand for the fish in the marketplace. Paradoxically, because IUU fishing activities have to some extent been reduced over the past two to three years, the supply of toothfish internationally was also reduced. The drop in supply has subsequently contributed to the high prices currently paid for toothfish for those legitimate fishers still in the industry.

The mislabelling or relabelling of fish are common problems in the seafood industry. This study suggests that Patagonian toothfish is known by over 30 different names, thereby confusing traders and consumers because they are unable to identify what fish they are purchasing (Table 5.5).

Table 5.5: The many names of Patagonian toothfish

Argentina	Merluza negra, Black merluza, Légine merluze or Bacalao de profundidad
Africa	Patagonian toothfish, Antarctic icefish
Australia	Patagonian toothfish, Antarctic icefish
Canada	Chilean seabass, Butterfish
Chile	Merluza negra, Bacalao de profundidad, Chilean seabass, Chilean grouper, Codfish, Black hake
China Mainland	小鱗犬牙南極魚 (Silver perch)
Falkland Islands	Patagonian toothfish
France	Légine austral
Germany	Black hake, Schwarzer peechecht
Japan	Ookuchi, Mero, Stonefish, Chilean seabass
Mauritius	Butterfish
Norway	Dypvannstorsk
Poland	Antar patagónski
Portugal	Marlonga-negra
Russian Federation	Patagonskiy klykach
Singapore	Cardinal fish
Spain	Ròbal austral, Austro Merluza negra, Bacalao de profundidad, Mere, Hake, Sea bass, Chilean seabass
Sweden	Tandnoting
United States	Patagonian toothfish, Chilean seabass, Antarctic codfish, Butterfish, Antarctic icefish
United Kingdom	Patagonian toothfish, Chilean/Antarctic/Australian/Southern Ocean seabass, Antarctic icefish, Black hake, Chilean grouper
Uruguay	Merluza negra, Black merluza, Patagonian toothfish

Sources: Argenova S.A. (2005); Bertullo (1999); Brown (2000); Catarci (2004); Fallon & Kriwoken (2004); Fallon & Stratford (2003a, b); Fish Base (2004); *Fishinfo.com* (2001); FMNH (2004); Guillen (2002); Hutchison (2004); IFP (2004); NET (2004c); Onestini *et al.* (2001); Pacific Andes International (2006); Pacific Seafood Group (2004); Schulman (2003); Smith (2004); Willock (2002)

To mask its identity from traders and consumers, Patagonian toothfish is commonly *rechristened* to other market names including Sea bass, Chilean sea bass, Mero, Bacalao de profundidad, Merluza negra, Ròba, Légine austral, Antarctic cod or Black hake (Daspin 2004; Fallon & Kriwoken 2004; Fallon & Stratford 2003a; Lewy 2004; Middendorf 2001; Smith 2004). Originally, this species was renamed by “wily Chilean marketers who wanted to create a demand for their catch” because they thought that the name Patagonian toothfish was unpalatable (*Bizjournals.com* 2002: no page).²¹¹ Brownstein *et al.* (2003: no page) also state that the multiple names by which Patagonian toothfish products are sold make “navigating options on a menu or at a seafood market ... tricky” for consumers. Importantly, the mislabelling or relabelling of toothfish cause market uncertainty and exacerbate IUU market activities because illegal operators can mask the identity of illicit products. Considering the present naming system, informed consumer decision-making is nearly impossible. Restaurateurs and consumers are unable accurately to make environmentally-based decisions about the sustainability of the toothfish fisheries, or about whether the fish has been harvested legitimately, illegally or in an unregulated manner. Given that consumers from the Northern Hemisphere purchase the majority of Patagonian toothfish products, they potentially have a greater opportunity to curb IUU toothfish trade by influencing market demand such that it becomes unattractive to harvest the species unsustainably.

5.5 Observations

Although the toothfish fisheries are small by world standards and fishing for these species both inside and outside the Convention Area is a minor part of any State’s fishing business, an analysis of the fishing industry highlights that many pressures impact upon the stocks. Notably, the rapid decline of Patagonian toothfish stocks is due to a combination of biology (for example: long life span, low fecundity and preference for near-shore habitats), over-fishing in some regions, IUU fishing and market activities. Declines in Patagonian toothfish stocks are also due to the failure of state actor-networks to mobilise effective and consistent fishing and trading policies, laws and regulations, international and corporate arrangements, and other measures to interrupt the activities of IUU operators and influence their dissident behaviours.

The mobilisation of various international and national intermediaries by those seeking to manage and conserve the toothfish fisheries indicates the global nature of problems faced by those managing Southern Ocean resources and forecloses on effective fisheries management arrangements. To date, policing activities have only curbed IUU fishing activities in waters around South Georgia and possibly the HIMI region (Agnew 2004; CCAMLR XXIII 2004a). In addition, although the international legal regime and other regulatory texts can impose restrictions or judgments on fishing operations such as those made by the International Tribunal for the Law of the Sea in relation to the

²¹¹ Although commonly called Sea Bass or Chilean sea bass, the Patagonian toothfish is a unique species.

prompt release of suspected illegal toothfish fishing vessels, these measures are being intentionally challenged and contested by IUU fishers. Legal texts are especially vulnerable since enforcement depends on national action (under international law) and in turn, national action does not provide for the sanction of States which fail to exercise their international law responsibilities. Unfortunately, many States have not fully complied with their international responsibilities as “flag states, port states, coastal states, states of vessel owners and trading nations” (OECD 2004a 1-2). Brought into question in this destabilisation of high seas governance structures and jurisdictional control over fishers by CCAMLR members and States is the very management of the toothfish fisheries and the capacity of those in various international and national actor-networks to discipline dissident actor-networks.

In this vein, the over-exploitation of the toothfish fisheries contradicts the argument that some non-state actor-networks such as fishers, traders and consumers are capable of recognising and reversing problems without recourse to central authority or the market (see Olstrom 1990). However, actors and networks in the *Dissident IUU Sub-network* fail to recognise and/or acknowledge the detrimental consequences their individual and collective interests. They also fail to modify their behaviour and impose restrictions on their actions to apply individual and collective self-restraint to safeguard toothfish resources for the common good. Therefore, trust as an important element of organisation is compromised by IUU operators who act in a dissident manner to thwart collective action, exacerbate fishery and market uncertainty and render the *Patagonian Toothfish Network* precarious.

Chapter 6

Pressure Groups Enter the Debate

6.1 Introduction

The issues affecting the Patagonian toothfish fisheries parallel those occurring in other global fisheries. Where national borders are being increasingly traversed, the reconfiguration of sovereignty, globalisation and economics, and the development of technology and communication illustrate how global flows and actor-networks are undermining traditional notions of hierarchy, sovereign power and State jurisdiction (such as autonomy, authority, control and population). For Luke (1993: 240), this displacement embodies flows that are:

... decentering, despatializing, and dematerializing forces, and they work alongside and against the geopolitical codes of spatial sovereignty. Within the flow, there are new universals and new particulars being created by the networks of accelerated transnational exchange and fresh identities, unities and values emerge from sharing access to the same symbolism.

Wapner (1996) explains that the reconfiguration of sovereign power is based on politics *beyond the State*, the formation of alternative channels of control and authority, and the reshaping of social meanings and beliefs by different social actors. The decisions and actions that affect the management, conservation and protection of the Patagonian toothfish are being taken by non-state actors (or free subjects) at different spatial scales in the *Patagonian Toothfish Network*. Some influential actors are state actor-networks (such as CCAMLR members, government officials, or scientists and fishers involved in government fora). Others are non-state actor-networks who come together in formal or informal groups, or individuals who seek to represent their own views or the views and interests of others at local and global levels (Arts 2004). In particular, the establishment of international environmental institutions and the activities of trans-national environmental actor-networks, including particularly NGO pressure groups, scientists, financial groups and media conglomerations, are creating new forms of governance and authority and are increasingly injecting unexpected voices into the Patagonian toothfish debate. According to Litfin (1998), while non-state actor-networks may not replace state actor-networks or exert as great an influence as state actor-networks, they may be modifying the character of sovereign power and State jurisdiction particularly because authority may be devolving from the State to identities more entwined with specific ecosystems and actor-networks.

This chapter explores the ability of non-state actor-networks to mobilise power and influence other actor-networks in the *Patagonian Toothfish Network* by enrolling the interest of pressure groups. These groups are increasingly influencing not only

CCAMLR members and national governments but have also mobilised sometimes hidden actors and networks to take action to conserve and protect the Patagonian toothfish at global, regional and local levels. The rise of NGOs in international affairs is outlined, followed by a description of the key NGOs that influence the Patagonian toothfish debate. For Dean (1999), these free subjects are situated in organic and rhizomatic actor-networks of affect, identification and care, and embody the principles of governing through self-limitation. They are found in NGOs structures and the general community, and take their place in the actor-network based on the basis of their beliefs, lifestyle choice, voluntary association or patterns of consumption. They may also subjectify other actor-networks by simplifying complex issues/processes in the actor-network and choose what will be made sovereign. In addition, their decisions and actions are calculating because their ability to mobilise power can be monitored and made calculable. In an effort to elicit support to protect its numbers, Figure 6.1 illustrates how the Patagonian toothfish cuts or weakens (destabilises) NGO links with other non-human actor-networks in the ecosystem, fishers, CCAMLR members and national governments, scientists and researchers, IGOs, other NGOs, and processors, traders and consumers (see Callon 1986 in Section 2.4.3). In this respect, NGOs connect with the Patagonian toothfish when NGO campaigners mobilise resources, toothfish conservation campaign strategies and community attention to specifically protect the species. Conversely, the Patagonian toothfish can strengthen (stabilise) NGO links with other actor-networks when NGOs engage in cooperative action to manage and conserve valuable Patagonian toothfish stocks.

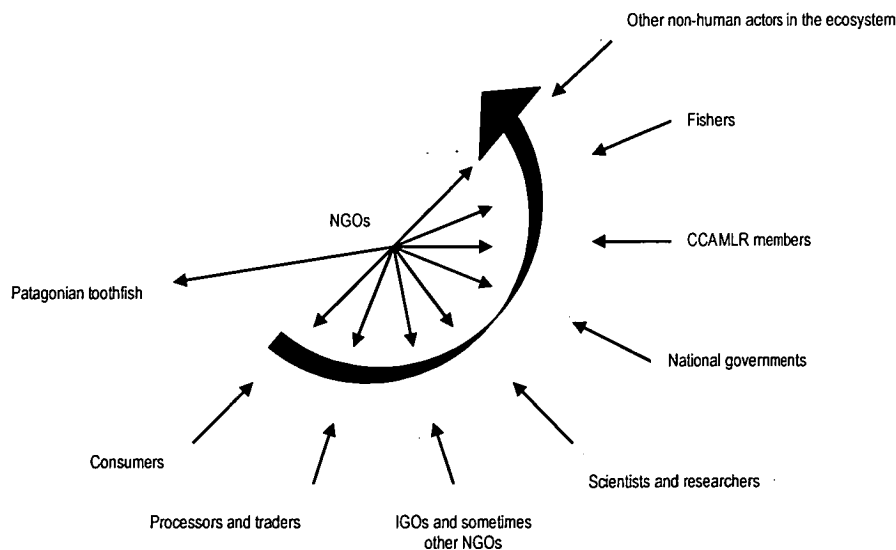


Figure 6.1: *Interessement* on the in-between where the Patagonian toothfish interests NGOs

6.2 The rise of NGOs

NGOs comprise voluntary or *not-for-profit* actor-networks who come together to share interests, ideologies, political aspirations or cultural affinities outside formal State structures (Arts 2004; Borrini-Feyerabend 1997; Bromley 1997; Doyle 2000; Doyle & McEachern 1998; Wapner 1998). They may be sectoral groups that act on behalf of a segment of society (such as trade unions, agriculture associations, professional associations or recreational clubs), or promotional groups that are more likely to act on a cause for others (such as welfare agencies, religious organisations, political parties or pressure groups) (Willetts 1982). They are *sovereignty-free* actor-networks who inject unexpected voices into international discourse, challenge orthodoxies, promote social change by attempting to raise new issues or altering how others are addressed, concentrate on influencing public opinion and frequently take their concerns beyond national boundaries or situated populations (Kellow 2000; Gordenker & Weiss 1996; Rosenau 1990; Van der Heijden 1999; Wapner 2000). NGOs have become increasingly influential, particularly when they have rapidly transmitted information or political ideas to target governments, IGOs, industry operators and the general public with the aim of pressuring other actors and networks to respond to change (Rootes 1999a, b; Wright 2000).

The first proto-NGO was perhaps the Rosicrucian Order that was formed in the late-1600s only 50 years after the 1648 Treaty of Westphalia defined the nation-State (Keohane & Nye 1977; Wikipedia 2005e) although other groups dating back to the sixteenth century formed to protect birds (Birnie & Boyle 1992).²¹² Modern NGOs have existed for over 100 years, since their creation in Europe (particularly in the United Kingdom) by Victorian naturalists and philanthropists. They gained prominence at the 1919 *Versailles Peace Conference* held in Paris, France, when national governments, NGOs and interest groups came together to create the League of Nations to promote peace, international cooperation and security (Archer 1983; Schoenherr 2004). NGOs then entered the international jargon in 1945 when they received formal mention in the 1945 Charter of the United Nations, Article 71 that empowers the Economic and Social Council (ECOSOC) to consult with NGOs on matters within this IGO's competence (UN 1945; Gordenker & Weiss 1996).²¹³ They became prominent at a time when nation-States were formally adopted and imposed globally.

Since the mid-1900s, the aims and activities of NGOs have become increasingly diverse and entwined, and they act globally, regionally, nationally and locally (Arts 2004; Doyle & McEachern 1998; Gordenker & Weiss 1995; Reimann 2002; Rittberger 2000).

²¹² The YMCA formed in 1855, the Red Cross was founded in 1863, and the movement to save whales began in 1910 (see Archer 1983; Darby 1994; Natsios 1996).

²¹³ The 1945 Charter of the United Nations, Article 71 states the ECOSOC "may make suitable arrangements" for consultation with NGOs which are concerned with matters within its competence (UN 1945). NGOs have status ranking and a direct and formal relationship with the UN through ECOSOC.

They vary “according to their seriousness of purpose, depth of research, skills in political advocacy, means of exercising pressure, and narrowness of focus” (Birnie & Boyle 1992: 76) and usually feature a constitution that states their goals (Doyle 2000). NGOs are also able to circumvent State centralism, are politically dynamic and form part of the politicised *global civil society* (Boutros-Ghali 1996; Breitmeier & Rittberger 2000; Finger 1994; Litfin 1998; Lipschutz & Mayer 1997; Murphy 2005; Williams & Ford 1999). For Wapner (1996; 1997; 2000), the *global civil society* is the domain that exists above the individual but below the State and acts across State boundaries. It is a set of relational trans-national networks where people voluntarily organise themselves to pursue various aims that result in a sense of allegiance and societal norms.²¹⁴

In this context, NGOs are spatialised “personifications of the social functions” that are often in a state of flux with the rise and trans-boundary nature of issues, change of leaders or fundamental changes in governments and relationships of nation-States (Lador-Lederer 1963: 59). Other factors influencing their capacity to take action include the availability of financial resources, expertise of staff members, strength of membership bases, webs of inter-personal linkages formed with other actor-networks, and the pull on these actor-networks resulting of competing demands or conflicting agendas. In these trans-national organisational relationships, a web of informal personal links may develop to confront issues characterised in officially sanctioned and formal diplomatic actor-networks that are defined by a legal framework. In an effort to pressure more powerful actor-networks to take positions NGOs are increasingly networking their activities and forming coalitions at local and global levels that focus on specific campaigns and strategic alliances that accommodate multiple perspectives (Arts 2004; Eccleston 1996; Gordenker & Weiss 1995; 1996; Keck & Sikkink 1998; Kimball 1999; Leipold 2000; Wapner 1996; 2000; Wright 2000).²¹⁵ These actor-networks are generally consensual and represent flat or horizontal organisational forms in contrast to vertical ones based on the hierarchical authority of States and markets. For Wapner (2000), networking and coalition-building encompass coexistence of autonomy and interdependence, and these bonds are perhaps the most important strength of NGOs. In addition, since the international arena lacks a centralised global government, the influence of NGO coalitions and alliances is enhanced because effective cooperation among States operating in this anarchic environment often implies the kind of informality and network-building that works well for NGOs.

²¹⁴ The *global civil society* can be “a strategy for assimilating domestically dangerous ideas” by adjusting them to the policies of the dominant coalition and thereby obstructing the formation of (class-based) organised opposition to established social and political power (Williams & Ford 1999: 275). It is political, where States play a key role in stabilising property rights and making trans-national economic interaction possible, but also involves freedom where individuals pursue personal interests (Wapner 2000).

²¹⁵ Since the 1972 Stockholm *Conference on Human Environment*, and the 1992 *Earth Summit* and Rio de Janeiro *Conference on the Environment and Development* that reaffirmed the declarations of the *Stockholm Conference* in relation to humans being “at the centre of concerns for sustainable development” (UN 2006: no page), NGOs have established actor-networks amongst themselves to exchange information and coordinate strategies (Wapner 2000).

NGO cooperation may be *top-down* where hierarchy prescribes a common direction for achieving centrally-derived purposes. Groups working in this mode often have exclusive educational or research purposes and include scientific international professional bodies such as the ICSU or SCAR. *Bottom-up* cooperation may be generated by NGO networking, coalitions or alliances of various national and/or international groups. Here, ENGOs may form *green webs* or actor-networks with varying degrees of formality to advocate shared values or particular courses of action, such as the IUCN²¹⁶ and Friends of the Earth (FOE).²¹⁷

ENGOs are highly visible, heterogeneous, promotional, pressure groups that represent a grassroots activism and “work to conserve resources, reduce pollution, and protect the nonhuman world” (Wapner 1998: 284). They have proliferated over the past 25 to 30 years at a time when great environmental change has extended across sovereign borders (Darby 1994; Reimann 2002).²¹⁸ Most notably, an ENGO coalition gained prominence in the 1970s when it developed a successful media campaign, organised consumer boycotts and pressured the United States Government to protect dolphins and their marine environments in the so-called *Dolphin Tuna Case*.²¹⁹ This was a time when unparalleled communication and technological transaction resulted in the establishment of a new world technological order and pluralism in State objectives (Gordenker and Weiss 1996; Rittberger 2000; Wapner 1998). These organisations each put forward a political world view with their interests including human rights, poverty, development, public health issues and other environmental concerns. Many advanced a combination of causes that loosely can be associated with protecting the world’s ecosystem. Generally, they promote environmental awareness to shape economic structures, social mores and cultural understandings by strategically lobbying States, influencing international regime formation and implementation, and increasing public awareness.

²¹⁶ The IUCN formed in 1948 and has an overarching role amongst ENGOs. Headquartered in Gland, Switzerland, it has governmental and non-governmental members from 140 States and who promote the protection and sustainable use of living natural resources based on adequate science (Bromley 1997; Darby 1994; IUCN 2003a). Its objectives are laid out in the 1980 *World Conservation Strategy* and 1982 *United Nations World Charter for Nature*. The IUCN draws upon an extensive network of experts that contribute to six subcommittees including Environmental Policy, Law and Administration, Sustainable Development, Education, National Parks and Protected Areas, Ecology and Species Survival. It became involved in Antarctic affairs from 1987 as an *invited expert* to ATCM and CCAMLR (Herr 1996).

²¹⁷ FOE was founded in 1971 and is based in Amsterdam, The Netherlands. It is a decentralised federation of ENGOs from 68 States who campaign on environmental and social issues to promote sustainable societies (FOE 2004; *Interenvironment.com* 2004). FOE provides significant support to ASOC (Kellow 2000), has actively promoted Antarctica as a Wilderness Area and opposed CRAMRA (Suter 1991).

²¹⁸ In the United States alone, registered ENGOs grew from two in 1969 to almost 100 by 1990 (Dowie 1996), and there are now thousands of ENGOs globally (Wapner 2000).

²¹⁹ The *Dolphin Tuna Case* demonstrates the political complexity of a trans-boundary and high seas environmental issue, and how ENGOs were able to insert themselves into domestic and international policy processes during the 1970s. The emphasis here highlights areas of *global civil society* where national governments were lobbied and politics went beyond the State to reshape public understandings and beliefs concerning dolphin bycatch in the tuna fisheries using the media and advocacy actor-networks (see Finger 1994; Leape 1998; Lipschutz & Mayer 1997; Wapner 1996; Wright 2000). The *Dolphin Protection Consumer Information Act* (DPCIA) was subsequently enacted by the United States Congress in 1970 that permitted conforming tuna products to be labelled as dolphin-friendly (United States 1990).

Political liberalism, a more cosmopolitan and global society, and higher levels of education, public interest and technological transaction have resulted in contemporary ENGOs disseminating their ideas widely. They have also developed powerful positions within the global political arena due to the trans-boundary nature of environmental problems, and because they demonstrated the importance of public participation to government legitimacy (see Agnew & Corbridge 1995; Laclau & Mouffe 1985; Wapner 1998; Van der Heijden 1999).²²⁰ As global issues emerged, ideology and technology altered, and exchange and information flows became more sophisticated and efficient, ENGOs benefited because they used tactical strategies to campaign in confrontational ways and took greater risks than nation-States who might have been reluctant to take a proactive or politically charged ecological stance (Litfin 1998; Leipold 2000).²²¹ They have also sought to diminish the privileged role of the State's claims to authority, questioned the helpfulness of sovereignty whereby States hold privileged authority over their own resource management and circumvent environmental regulations and/or global concerns that do not coincide with the national interest, and promoted the general principle of *good neighbourliness*.²²² Despite ENGOs apparently holding low authority and being considered as naïve within some State and industry fora, their acceptance by the general public resulting from this *good neighbourliness* stance is often high, and through this influence they have generated legitimacy and promoted a changed future for the world.²²³ This notion is also captured in the Stockholm and Rio Declarations which emanated respectively from the 1972 *United Nations Conference on Human Environment* and the 1992 *United Nations Conference on the Environment and Development*. Principle 21 of the Stockholm Declaration proclaims that:

States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction of control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction (UN 1973: 5).²²⁴

The later Agenda 21 is not legally binding, it is an important demonstration of the acceptance of State rights and responsibilities by the international community and how

²²⁰ The trans-boundary nature of environmental problems presents a dilemma for States to cooperate successfully with various actors, and governments need to surrender some part of sovereignty, geographical primacy or political freedom where their national interests may be unclear (see Agnew & Corbridge 1995; Carroll 1988). This situation creates State/non-state tension as governments seek to retain power (see Laclau and Mouffe 1985).

²²¹ Like in political campaigns, tactics are important strategies in ENGO campaigns (Leipold 2000).

²²² *Good neighbourliness* is crucial to contemporary international environmental proaction and contesting conceptions of sovereignty (Wapner 1998; Kaimieniecki & Scully Granzeier 1998).

²²³ For example, Amnesty International may receive hostility from governments whose practises are under scrutiny. By reflecting and representing public feeling, this NGO generates legitimacy and its authority may be increased its acceptance by the public increases (Arts 2004).

²²⁴ Principle 2 of the Rio Declaration reiterated Principle 21 of the Stockholm Declaration almost verbatim and recommended that States pursue resource policies within their own domains without outside interference, but they must consider the external effects on other States (Wapner 1998).

a wide range of actor-networks are enrolled into a vision-driven sub-network that squeezes the debate through its own OPP (see Agenda 21 1992; Selman & Wragg 1999). In this regard, Brenton (1994) identifies four forces for cohesion in international environmental politics that confirm this OPP, including *toe-in-the-door* negotiating processes such as conventions and protocols at the trans-national level, reliance upon science and epistemic communities, the influence of ENGOs, and environmental altruism or justifications that are difficult to resist (Darby 1994; Wapner 1998). Kellow (2000) argues that ENGOs are linked to these forces because they are significant sources of moral justifications and national governments find it difficult to resist rhetorical calls to save the planet. However, he questions the role of ENGOs and the norms they advance in the development of international environmental institutions, and considers that they operate within spaces structured by those institutions rather than transforming them.²²⁵ Therefore, the growth of ENGOs has occurred within the context largely structured by international governance regimes and, although they pose challenges to these arenas, they operate within structures that have been defined by IGOs. As such, the power of NGOs can be tied to their recognition and acceptance by IGOs and governments.

Some theorists suggest that the influence of ENGOs in the *global civil society* is exaggerated and has not changed State-society relationships nor altered the fundamental role or power of nation-States in world politics (see Bohman 1999; Breitmeier & Rittberger 2000; Murphy 2005; Wendt 1999; Williams & Ford 1999).²²⁶ ENGOs can choose to join or refuse membership in IGOs or abstain from decisions taken in IGO and government fora (Taylor 1984). In addition, ENGOs are not above scrutiny because they are not elected and are relatively unaccountable to their funders, and nor are their funders accountable to the general public.²²⁷ The power of ENGOs can also be diluted or they may disband quickly when communications within their structures break down or they become arrogant, territorial or competitive due to conflicts about ideological differences, power, paternalism and accountability (Leipold 2000). Nor is the support for, or influence of, ENGOs equal among developed and developing States and many powerful organisations are based in the United States and Europe (Reimann 2002).

Despite such criticisms, other theorists reject these *State-centred* claims and consider that the influence of ENGOs continues to increase as they work to boost global responsibility among States and diminish the self-oriented nature of States, a position which is supported in this study (Arts 2004; Darby 1994; Nye & Donahue 2000;

²²⁵ Norms can play important roles in constructing national interests and pressuring States. However, the norms advanced by ENGOs are unlikely to construct a global value system, an international environmental policy is poorer for disregarding the extent to which national interests pervade the international policy process (see Finnemore 1996; Kellow 2000; Shue 1992; Skolnikoff 1993).

²²⁶ Analysts also question whether the *global civil society* has strong claims to democratic authority or whether the assumption that State power has been irredeemably weakened by environmental concerns or globalisation is correct or not (see Brahm 2005; Strange 1995; Weiss 1998).

²²⁷ FOE, WWF and Greenpeace speak with authority but are not elected and relatively unaccountable.

Rittberger 2000). ENGOs retain power by maintaining their independence from governments and ensuring they do not act as surrogate implementers of government policies (Wapner 1998; 2000; Willetts 1982). They are also more successful when they concentrate on a single issue or set of issues, limit themselves to project work and remain opportunistic, not in terms of their beliefs, but in terms of reaching audiences as they derive their legitimacy from their popular support (Gordenker & Weiss 1995).

Therefore, the apparently *sovereign-free* character of ENGOs (as opposed to the constitutions and audits done by States) helps them to engage in ecopolitics by assisting to forward longer-term environmental perspectives, develop stronger regimes, set the agenda for cooperation between actors and networks, identify failures, engender greater compliance, and upgrade accords when new environmental knowledge is understood. They can also play an important role in conflict resolution if they have a respected vision, are credible with local people and governments and have resources (Borrini-Feyerabend 1997; Darby 1994; Litfin 1998). Gordenker and Weiss (1996) conclude that the crucial function of ENGOs is to hold States accountable for their actions by creating trans-national links between state and non-state actor-networks in terms of politicising the previously unpoliticised and connecting local concerns with the global perspective. However, little is known or documented about how they carry out their work (Reimann 2002; Wapner 2000). Even less is known about the emerging industry NGO (INGO) sector. For Breitmeier and Rittberger (2000), the relationship between ENGOs and INGOs is particularly under-researched despite the significant cooperation that has occurred between these actor-networks in recent years due to their converging environmental interests. Their success in modern politics depends on States and IGOs increasing international political opportunities and supporting new state-society dynamics that include NGOs in decision-making processes.

6.3 Key NGOs in the actor-network

6.3.1 Increasing influence of NGOs in Antarctic affairs

Until the late-1970s, SCAR was the most influential NGO in Antarctic affairs (Section 3.5.2). The second period of NGO activity commenced in the early-1980s when ENGOs became increasingly influential in Antarctic and Southern Ocean affairs after they gained consultative status, or acted as consultants or delegates, at international meetings focused on the Antarctic region (Beck 1990; Herr 1996). ENGOs (except ASOC) then dropped out of Southern Ocean campaigning efforts in the early-1990s “because there were no *hot button issues* in which to seek funding” (Respondent 25). The third period of NGO activity then arose in the mid-1990s when ENGOs reignited their Southern Ocean campaigns after IUU fishing peaked in 1996/97 and the issue became political and subsequently fundable. Over the past five years, a fourth period of NGO activity has emerged with the formation of market-focused ENGOs and other INGOs that work alone or in cooperation with governments IGOs and NGOs. The major events leading to

NGOs entering the Patagonian toothfish debate in their effort to protect this species are summarised in Appendix C.

Since the late-1990s, the perceived relative failure of international and national systems of governance to control IUU fishing has prompted engagements in the *battle* by various NGOs in CCAMLR and State fora. They have influenced norms and policies for ocean use, supported research and analysis to inform decision-making, provided technical and financial assistance to back the conservation efforts of other actor-networks, and reviewed the performance and progress of government and industry actions (see Kimball 1999). Of these environmental, industry and scientific NGOs, nine organisations emerge in the *NGO Sub-network* as key pressure groups including ASOC, Greenpeace, WWF, ISOFISH, Trade Records Analysis of Flora and Fauna in International Commerce (TRAFFIC), MSC, NET, COLTO and the Sea Shepherd Conservation Society (hereafter Sea Shepherd).

With the exception of Sea Shepherd which acts in isolation, these key NGOs have networked their activities and formed global coalitions and alliances to harmonise common positions on issues, and to increase their legitimacy. They are often anchored by shared goals and understandings, political experience, finances, expertise and joint participation in international fora. For example, since 1977, many Antarctic focused ENGOs have coordinated their activities through ASOC and, in 2003, an INGO actor-network of licensed fishers formed the industry-led alliance known as COLTO and members have since actively collaborated with ENGO groups. In addition, the first IUCN representative was included in the United States delegation to CCAMLR in 1980, other ENGO representatives were included in the Australian and New Zealand delegations to ATCM in 1983 (Darby 1994) and, thereafter, ENGO representatives have continued to be included on national delegations to these meetings.

Respondent views from the nine key NGOs are included in the following chapters along with the views of three additional NGO respondents from the Syndicat des Armements Réunionnais de Palangriers-Congélateurs (SARPC), Southern Seabird Solutions (SSS) and Blue Ocean Institute (BOI). The key pressures affecting the toothfish fisheries identified by these respondents are detailed in Figures 5.6, 5.7 and 5.8 and Appendix B. They argue that IUU fishing is the most significant pressure on the toothfish fisheries, followed by the need to ensure resource sustainability, and stopping incidental mortality of bycatch and other environmental damages caused by fishing. NGO respondents also voice their concerns about the ineffectiveness of CCAMLR and its members to stop IUU fishing or stop some flag, port and market States from sanctioning IUU activities.

In the following discussion, I examine how the nine NGOs form key nodes the *NGO Sub-network*, pressure other actor-networks and influence the *Patagonian Toothfish Network*. They are detailed sequentially in Table 6.1, depending upon when each organisation entered into the toothfish debate.

Table 6.1: Key pressure groups

Key NGOs	Founded	NGO status	Funding	Key influence
ASOC (USA)	1979	ENGO Independent*	To maintain independence, ASOC does not accept donations from governments or private corporations but relies on memberships and private grants	Entered toothfish debate in the mid-1980s Key policy focused ENGO that represents more than 240 ENGO groups in ATS and CCAMLR fora
Greenpeace (The Netherlands)	1971	ENGO Independent*	To maintain independence, Greenpeace does not accept donations from governments or private corporations but relies on memberships and private grants	Entered toothfish debate mid-1990s Key ASOC member that also works alone in high profile and public non-violent, direct action campaigns
WWF (Switzerland)	1961	ENGO Semi-independent	Funding from memberships, governments and private corporations; and from major donors, philanthropic trusts and other institutions	Entered toothfish debate in the mid-1990s Key ASOC member that also works alone in policy and scientific fora
ex-ISOFISH (Australia)	1997 - 2001	ENGO and INGO Semi-independent	Funding from the TCT, ASOC, Australian legitimate toothfish fishing operators and the Australian Government	Entered toothfish debate in 1997 to expose IUU fishers Supported by ASOC, the Australian Government and toothfish industry
TRAFFIC (United Kingdom)	1976	ENGO Semi-independent	Joint project of WWF and the IUCN that works with CITES – other funding from governments, corporations, foundations and NGOs	Entered toothfish debate in 2001 Monitors international trade in wild species (including toothfish)
MSC (United Kingdom)	1997	INGO Independent since 1999	Funding from industry/scientific partnerships that include trusts and foundations, development agencies, corporations and donations	Entered toothfish debate in 2001 Supported by ENGOs and the fishing industry to certify sustainable fisheries
NET (United States)	1994	ENGO Independent*	Funding from memberships and stipends from private foundations	Entered toothfish debate in 2002 Key ASOC member focusing on trade
COLTO (Australia)	2003	INGO Independent	Funding from industry memberships from legitimate toothfish fishing operators worldwide	Entered toothfish debate in 2003 Represents the legitimately licensed toothfish industry
Sea Shepherd (United States)	1977	ENGO Independent*	Funding from memberships, corporate and celebrity donations and sponsorships, and revenue from the online Sea Shepherd Shop	Entered toothfish debate in 2003 Not supported by other NGOs and acts in a dissident and aggressive manner

*Independent non-profit organisations under Section 501(c)(3) of the US Internal Revenue Service Code
 Sources: ASOC (2004a; 2005a); COLTO (2005); Greenpeace (2006); *InterEnvironment.com* (2005); MSC (2002); NET (2005); Respondents 12, 25, 38 and 69; Sea Shepherd (2006); TRAFFIC (2003a); WWF (2005a)

I consider their *structure* (including resource availability and membership base) and the *relationships* they form with other actor-networks (or translational web of linkages). I then refer to eight additional pressure groups that have been, or are emerging as, influential NGO actor-networks in the *NGO Sub-network*. Collectively, the strength of relationships the NGOs develop and their capacity to remain autonomous and independent from governments are important in the discussion because these factors provide evidence on each organisation's political legitimacy and community acceptance in the *Patagonian Toothfish Network*. This component of the study is important because the ability of NGOs to exert power is increasingly due to their capacity to connect with a diverse range of actor-networks and extend the *Patagonian Toothfish Network*. NGO respondents' views centred on the toothfish debate are also included in the following chapters.

6.3.2 Antarctic and Southern Ocean Coalition (ASOC)

To date, much international effort among ENGOs in CCAMLR has been directed through ASOC. This pressure group was formed in 1977 as a loose international coalition of ENGO groups to coordinate activities with respect to Antarctica and its surrounding oceans and to provide input into the ATS (Boyd 2002; *Interenvironment.com* 2004; Wapner 2000). It was founded principally by Jim Barnes (FOE), Lyn Goldsworthy (Greenpeace International) and Cassandra Torris (WWF) because they were concerned that ATCPs were failing to stop Soviet fishers from over-fishing Marbled rockcod in the 1970s (Respondent 25), were not conducting their activities transparently, and were only considering the views canvassed in meetings that were closed to the public (Respondent 36). ASOC comprises over 240 conservation groups from more than 50 countries at the time of writing and, as such, captures generally less powerful interest-driven actor-networks (ASOC 2005a).²²⁸ Although it claims a diverse range of members, it is backed by an active handful of the world's powerful ENGOs. Its strength stems from this alliance, its relative singularity of purpose and its ability to draw upon many contacts and access governments (Fallon & Kriwoken 2004).

The Antarctica Project was established in 1982 as the Secretariat of ASOC, and it continues to be based in Washington DC, the United States, to coordinate Antarctic related campaigns.²²⁹ It has a particular role in developing actor-networks, coordinating and disseminating information, formulating joint position papers for its members, lobbying governments, coordinating meetings with governments, and representing its

²²⁸ The membership base constantly changes and in 2005, organisations paid annual dues of up to US\$10,000 (ASOC 2005a). Members are mainly in Australia, Europe, New Zealand and the United States although an increasing number are from Asia, Eastern Europe and South America. Some members were locally based and their influence in Antarctic affairs is questionable (Darby 1994).

²²⁹ In the early-1990s and at the height of ASOC's influence there were three ASOC Secretariats, The Antarctica Project (Washington, United States) ASOC-NZ (Wellington, New Zealand) and Greenpeace Australia (Sydney, Australia).

members by attending official meetings that are part of the ATS. It is not a consensus decision-making organisation, and policy is centrally controlled and executed by an inner ASOC governing body of executives. For Respondent 25, her past role as ASOC Director was one that tried to find a “degree of consensus” between its members whilst acknowledging that every group will retain its own politics, agenda and strategies.

Nonetheless, ASOC fulfils all criteria identified by the UIA as vital to the legitimate functioning of an NGO.²³⁰ It is an international organisation with collective membership from many States who are able to advance their ideas freely and engage in activities in many States (such as Australia, New Zealand, South America and the United States) (UIA 1976/77). There is no attempt to make profits for distribution to members, but given that it is funded by other ENGOs, its decisions may not always be self-determining. ASOC mostly works out of the public gaze on special projects and aims to make the impact of its members’ environmental voice bigger than the sum of the individuals by acting as a single actor-network cluster. ASOC campaigners have embraced satellite communications and the Internet successfully to coordinate domestic and international lobbying activities to pressure key Antarctic actor-networks. They mobilise *technologies of communication* to extend and stabilise social interactions over differing spatial scales to make information accessible at a distance (see Cordella & Shaikh 2006; Murdoch 1997b; Rose & Jones 2004). Importantly, the ASOC community is networked by their shared interests and the informational connections they make.

ASOC became involved in managing and conserving the Patagonian toothfish in the mid-1980s when fishers started targeting the stocks. However, prior to entering this debate, ASOC campaigned to “protect the biological diversity and pristine wilderness of Antarctica, including its oceans and marine life” in the early-1980s (ASOC 2001a: no page). It was involved in discussions that led to the abandonment of CRAMRA and its eventual replacement by the Madrid Protocol. Here, ASOC, WWF, Greenpeace, IUCN and other ENGOs played a key role in tracking and publishing new scientific evidence and lobbying governments to reflect new environmental realities or norms (see Arts 2004; Herr 1996; Wapner 1998). They successfully pressured other actor-networks to replace CRAMRA with a 50-year mining ban and to promote the idea of Antarctica as a World Park, codified by the Madrid Protocol.²³¹ ASOC also provided input into the original text of the Madrid Protocol as a ghost paper, where the credit of its authorship was given to ATCPs to claim as their own (Respondent 25). Writing ghost papers and

²³⁰ Criteria identified as vital to the legitimate functioning of NGOs include: (1) autonomy and the ability to express their views freely; (2) the need to be genuinely international and engage in activities in at least two States; (3) voluntary individual or collective membership from at least two States; (4) being open to any appropriately qualified individual or entity in the organisation’s area of operations; (5) the constitution must provide for a permanent headquarters; (6) the periodical election of a governing body and officers; (7) voting that prevents control by any one national group; (8) substantial financial contributions that come from at least two States and no attempt to make profits for direct distribution to members (see Archer 1983; Feld & Jordan 1983; Mansbach *et al.* 1976; Willetts 1982; UIA 1976/77).

²³¹ WWF and Greenpeace were also influential on the debates leading to CRAMRA’s abandonment, the development of the Madrid Protocol and the vision of Antarctica as a World Park.

distributing them to government officials who then present the documents at formal meetings is an important ASOC campaign strategy because if documents emanate from government sources they are taken more seriously by other actor-networks. ASOC has since contributed to the ongoing development of the ATS.

When ASOC was establishing its credibility, it needed to generate media attention about, and public support for, Antarctic issues in order to fund ongoing operations (Respondent 25). Its campaigners travelled to ATCMs, and lobbied on behalf of other ENGOs with an interest in the Antarctic to ensure that the rules passed by ATCPs were consistent with the ATS and effectively protected the environment. ASOC aimed to “force governments with their conscience” by “challenging the status quo” inside the ATS (Respondent 25). However, these campaigners were *outsiders* at ATCMs, had no official status, were not permitted to attend official meetings and could only lobby delegates outside the official meeting. Nonetheless, as ASOC captured more ENGOs into the coalition, it became more influential and transformed into the head-actor-network who spoke on their behalf.

ASOC also influenced ATCPs and provided input into the negotiations to establish the Convention on the Conservation of Antarctic Marine Living Resources particularly with regard to applying the ecosystem management as an approach to Southern Ocean fisheries management (Respondent 36). For Respondent 25, this was ASOC’s first powerful step into the ATS. In 1988, an observer invitation was issued to ASOC by CCAMLR members after ASOC indicated its commitment to the principles embodied in Article II and provided assurances regarding conditions of attendance and confidentiality (CCAMLR VII 1988 §153; Davis 1996).²³² It was subsequently granted observer status at the ATCM in 1990 (Darby 1994).²³³ ASOC representatives now regularly attend CCAMLR as part of the United State’s delegation and other campaigners lobby delegates informally. Respondent 25 states:

People [CCAMLR members] looked at us [ASOC], and some governments still do, and couldn’t understand why we were here at CCAMLR because it wasn’t our business ... and ... sometimes it is a love/hate relationship in that they don’t like what we have to say but ... are glad that we keep saying it because someone needs to inject dialogue into environmental issues. Then there are other governments that say ... we can’t speak up but we’re glad you can speak for us.

²³² In 1980, the United States failed to gain support for accreditation of ASOC as an observer at SS-ATCM-3. Along with Greenpeace, ASOC unsuccessfully reapplied to the CCAMLR Secretariat in 1983 seeking observer status. ASOC’s wide membership led CCAMLR to deal only with ASOC from 1984 (CCAMLR V 1986 §51). The invitation must be reviewed annually (ASOC 1988) although ASOC has attended CCAMLR since 1988.

²³³ Although ENGOs including ASOC, Greenpeace and FÖE, and IGOs including the FAO, IUCN and SCAR, influenced opinion and the CCAMLR negotiations, the only NGOs regularly invited as observers to CCAMLR until 1997 were ASOC and IUCN. However, these NGOs were “only barely tolerated by some delegations” (Johanson 1997: 214), and their tenuous involvement in CCAMLR underscores the point made by Gordenker and Weiss (1996: 17), who argue that IGOs often join with governments in common undertakings but NGOs traditionally have no formal standing in the global governance realm.

Nonetheless, CCAMLR exerts considerable transformative powers over ASOC. As an observer, ASOC cannot formally initiate action or vote in CCAMLR and is required to obey Rule 35 of the Convention on the Conservation of Antarctic Marine Living Resources *Rules of Procedure* which specifies that observers may submit information or position papers but they are not considered formal CCAMLR documents unless CCAMLR members so decide (CCAMLR 2003b Part VI; CCAMLR 2005k Part VI).²³⁴ By working through the OPP established by Rules 30-35 of the Convention on the Conservation of Antarctic Marine Living Resources *Rules of Procedure*, ASOC observers are allowed to make statements at SC-CCAMLR meetings if no one objects. This engagement with CCAMLR and its members and its increasing professionalism, has provided ASOC with a strong ENGO support base and an actor-network that is widely respected and influential in both state and non-state fora. This discussion illustrates how the *ASOC Sub-network* is black-boxed to some extent and becomes *punctuated* when it is converted into a single node in the *CCAMLR Sub-network* (Figures 2.11 and 2.12).

ASOC also distributes the FOE financed news sheet *ECO* at CCAMLR meetings and ATCMs to mobilise environmental power by commenting publicly on the progress of negotiations and action taken at these meetings (see ASOC 2001b, c; 2002a; 2003b, c; 2004a, c, d, g, h, i). This publication initially helped ASOC to alert CCAMLR members to studies on incidental mortality associated with driftnet fishing (see CCAMLR IX 1990 §5.8). Other contributions that were not published as CCAMLR documents were also distributed as ASOC non-papers in *ECO*. Through the information submitted by ASOC observers to CCAMLR via *ECO* and ASOC non-papers, and the lobbying of CCAMLR members, ASOC has “undoubtedly played a role in influencing the positions of some members on certain issues” (Johanson 1997: 216).

Despite ASOC gaining legitimacy in CCAMLR, its campaigners are still obligated to abide by the principles and objectives of the Convention on the Conservation of Antarctic Marine Living Resources and specified rules at official meetings. They need to exercise caution with regard to using any information obtained from these confidential meetings and are not permitted to release information to the media. However, information obtained unofficially during or after a meeting can be used. However, the line on what information can be used is *blurry* and although CCAMLR delegates may suspect ASOC of releasing confidential information, they remain supportive of ASOC retaining its observer status at CCAMLR providing that its observers “do not cross the line ... like Greenpeace posting numbers on placards” (Respondent 25).²³⁵ It is difficult to gauge how influential ASOC has been inside

²³⁴ NGO papers are documented in CCAMLR reports but are not necessarily supported by CCAMLR members. For example, Argentina and Chile were offended by the IUCN representative's comments in 1995 regarding CCAMLR being a fishery *regulatory* body (see CCAMLR XIV 1995 §11.10-§11.11).

²³⁵ The credibility and integrity and activities of ASOC can be compromised by the actions of other coalition members, particularly if they fail to inform ASOC about their activities.

CCAMLR given that its observers have yet to be invited to CCAMLR working group meetings. However, ASOC does foster relations with CCAMLR non-Contracting Parties. For example, the Mozambique Government (a CCAMLR non-Contracting Party) contacted ASOC when its officers detected an illegal Patagonian toothfish shipment entering into the country (Respondent 25). The Government was unsure about what action to take and an ASOC campaigner subsequently assisted its officers to contact the CCAMLR Secretariat with this information.

ASOC works closely with other ENGOs such as Greenpeace, WWF, Humane Society International (HSI), and the Tasmanian Conservation Trust (TCT),²³⁶ Whale and Dolphin Conservation Society (WDCS)²³⁷ and IUCN (Respondents 25 and 64). For example, if ASOC seeks media attention, it often forwards information onto other ENGO members such as Greenpeace or WWF to disseminate. ASOC also employs people in Australia, China, Europe, Russia, South America, South Korea and the United States to champion ASOC's campaigns (Respondent 36). However, in Russia, ASOC campaigners focus their efforts on the implementation of the Madrid Protocol rather than on CCAMLR issues despite this State being a CCAMLR member. In addition, the NGO movement is generally weak in South America due to cultural and financial reasons and, therefore, issues that surround the Southern Ocean do not have particularly high profile (Respondent 36). Nonetheless, given ASOC's concern about over-fishing of the Patagonian toothfish and because illegally caught fish has entered the global marketplace under the guise of legal trade in South America, ASOC considers that lobbying in this region is critical and it has subsequently been granted a prestigious Goldman Grant to conduct this campaign.²³⁸

Some ENGOs are not invited to become ASOC members.²³⁹ Because ASOC comprises members of activist and activist-oriented scientific groups who consider themselves as watchdogs that monitor the actions of other actor-networks, ASOC policy forbids the receipt of corporate or governmental funds from organisations with a vested interest in Antarctic or Southern Ocean affairs. Therefore, NGOs with corporate involvement are not invited to become members because serious conflicts of interest would arise for ASOC (Respondent 64). For example, ASOC, through its various member groups, is involved in the industry-based MSC review process for the South Georgia Patagonian toothfish fishery. However, to avoid a conflict of interest, ASOC and MSC remain separate. This policy also applies to SCAR to ensure that ASOC observers can objectively monitor the expert advice offered by this organisation at ATCMs.

Some of ASOC's campaigners have worked under retainers or consultancies, but today

²³⁶ The TCT was formed in 1968 to conserve flora, fauna and cultural features (TCT 2005).

²³⁷ The WDCS was formed in 1987 to protect whales, dolphins and their environment (WDCS 2006).

²³⁸ ASOC has been granted a major United States philanthropic Goldman Grant to work in South America to raise public awareness about the Patagonian toothfish and monitor trade in this species.

²³⁹ ENGOs including TRAFFIC, Sea Shepherd, Birdlife International, SSS, BOI and MBA; INGOs including MSC, COLTO, SARPC and ICFA and the scientifically based SCAR are not ASOC members.

many are working through other ENGOs (for example NET) and accepting new OPPs in an effort to mobilise greater support and resources (Respondent 36). The employment of ASOC campaigners by other ENGOs has led to these organisations becoming increasingly influential in Southern Ocean fisheries affairs, possibly diluting ASOC's influence. However, by drawing on a wider expertise base, NGOs are able to increase their expertise. For example, ASOC campaigners sit on various committees such as Respondent 25 previously chairing the IUCN Antarctic Advisory Committee. In this case, the IUCN can provide knowledge in the development of MPAs and ASOC can provide significant political and scientific knowledge on Antarctic and Southern Ocean affairs (Respondent 36).

ASOC campaigners initially connected seabird bycatch to the fishing for toothfish and used this association as a central part of their strategy to stop IUU fishing because the Patagonian toothfish remained hidden from the public gaze, and was therefore unable to mobilise public support. They also understood the considerable symbolic and visual power of albatrosses getting snagged and killed on longlines and its capacity to attract the general public's attention and add weight to the IUU fishing debate (Respondent 25).²⁴⁰ They then embarrassed CCAMLR members into taking more decisive action to stop seabird bycatch and IUU fishing by suggesting that the ATCPs reconsider whether CCAMLR members should be allowed to continue managing Southern Ocean fisheries given their inability to protect the fish stocks. For Respondent 25, this embarrassment resulted in CCAMLR members reaffirming their credibility in managing Southern Ocean affairs. In 2002, ASOC developed the *Red List* that publicly named and shamed fishing operators and vessels that may have been involved in IUU fishing activities (ASOC 2004b). From this point onwards, ASOC campaigners promoted the Convention on the Conservation of Antarctic Marine Living Resources as a conservation regime rather than a resource management regime. It also supported CITES action to protect toothfish species; CCAMLR enforcement measures for Parties engaged in IUU activities; strengthening the CCAMLR CDS to reduce loopholes; establishing the eCDS, cVMS and tightening of port State controls; developing whitelists and blacklists for all vessels operating in the toothfish fisheries; and blacklisting flag, port and market States involved in IUU activities (see ASOC 2005b, c, e, f). In addition, ASOC supports a *Toothfish Moratorium* on all toothfish fishing if IUU fishing cannot be stopped and banning the trade of all toothfish caught outside the Convention Area.

6.3.3 Greenpeace

Greenpeace was founded in 1971 and began as a small direct-action pressure group "when members of the *Don't Make A Wave Committee* in Vancouver [Canada] changed its name to reflect its aim of creating a green and peaceful world" (Kellow 2000: 4).²⁴¹

²⁴⁰ Seabirds became a mystical element in seafaring life and a legend developed that the souls of drowned seamen live on in albatrosses. ENGO actor-networks used these strong cultural ties in their campaigns.

²⁴¹ Paul Watson (now Sea Shepherd) also originally helped found Greenpeace (Wikipedia 2005d).

Today, Greenpeace is based in Amsterdam, The Netherlands, has regional offices in 41 States and mobilises revenue from three million supporters and grants from philanthropic trusts (Darby 1994; Wikipedia 2005c). It has a governing council that exerts direct control over major policy but works within ENGO actor-networks to achieve shared visions. As such, Greenpeace has come to prominence through the mastery of its high profile campaigners to bear witness and attract media attention on key policy issues. Greenpeace campaigners seek to be highly visible in the public eye, undertake non-violent direct actions and stunts to draw attention to environmental issues, mobilise public opinion through *designed-for-TV* actions, and maintain some distance from government and industry. However, they also engage in lobbying activities that include dialogue with governments and corporations, public awareness-raising, harnessing support for or opposition to various environmental policies, and providing policy/scientific advice to other NGOs and government authorities.²⁴² This approach has been successful in the toothfish arena. For example, as an ASOC member Greenpeace campaigners attend CCAMLR as ASOC observers, or attend CCAMLR as a member of the Australian delegation. They also attend Australian toothfish fishery policy fora such as the CCF, and like WWF, have provided input into FAO fisheries fora and the development of the UN Fish Stocks Agreement and IPOA-IUU.

Greenpeace adopted the Antarctic campaign in 1983 and campaigned against CRAMRA in 1984 (Herr 1996; May 1988). At that time, Greenpeace became a lead member of ASOC and campaigned unsuccessfully against the construction of the French airstrip at Dumont d'Urville proceeding without an environmental impact assessment. In 1987, it established the World Park Base at Cape Evans on the volcanic Ross Island (located in the Ross Sea) in order to press its demand for ATCPs to declare Antarctica as a World Park off-limits to commercial exploitation and pollution (Greenpeace 2000e). By maintaining this four-person base for five years (before its removal in 1992) and circulating photographic material that captured this region's beauty from an independent source, Greenpeace played a critical role as a catalyst for change with regard to raising public concern about the Antarctic (Respondents 36 and 41). Targeting this direct action campaign into government spheres of influence contributed to other ENGO actions that led to the abandonment of CRAMRA, development of the Madrid Protocol, promotion of Antarctica as a World Park, support for the *Whaling Moratorium* and alerting other actor-networks to impacts of seabird bycatch in the Patagonian toothfish fishery around South Georgia (see Dalziell & de Poorter 1993).

Greenpeace argued that in establishing a World Park Base, it demonstrated its commitment to the Antarctic by conducting significant research and fulfilled similar criteria to those applied to States seeking membership to ATCMs and it, therefore, also deserved observer status (May 1988). However, it has failed to gain representation at

²⁴² Greenpeace runs an independent science unit based at Exeter University, United Kingdom to provide professional scientific information and analysis (Respondent 36).

either ATCM or CCAMLR because some States object to Greenpeace's activist actions. As a result, Greenpeace has supported ASOC in taking the lead in ATCMs and CCAMLR, lobbies ATPs and CCAMLR members outside the official meetings, and supports the UN to take a greater interest in Antarctic affairs.

Campaigners within Greenpeace became increasingly concerned about IUU fishing in the toothfish fisheries during the mid-1990s. They have subsequently developed campaigns that include mobilising alliances with like-minded groups such as ASOC to pressure IUU fishers out of the fisheries, persuading national governments to take stronger actions to stop IUU fishing, and developing an extensive IUU toothfish fishing Internet website to address illegal fishing at a global level (see Greenpeace 2000a, b, c, d). However, because ASOC is a coalition that seeks to meet the interests of all its members, it may take a *softer* position than that advocated by Greenpeace. Consequently, the strategies of Greenpeace and ASOC have similarities and differences and Greenpeace works dissidently when conducting direct action campaigns to monitor and expose IUU fishing activities.

Although Respondent 25 considers that Greenpeace's direct action strategy is sometimes ineffective because it can fail to consider broader perspectives and generate discord with other actor-networks, Respondents 36 and 41 suggest that it has advantages over other ENGO strategies. This is because Greenpeace campaigners can directly access locations and bear witness to rogue environmental activities that might be occurring by gathering intermediary actor-networks including photographic, film or video evidence or by directly confronting the perpetrators of these activities. For example, Greenpeace successfully deployed the campaign vessel *Arctic Sunrise* to the Southern Ocean and discovered the unmarked Belize-flagged vessel *Salvora* illegally fishing in French maritime waters (Section 5.3.3).²⁴³ For Respondent 41, "it is thanks to Greenpeace that CCAMLR has needed to focus so heavily on IUU fishing and solutions [to curb IUU activities] including the cVMS and CDS."

Respondent 41 also acknowledges that Greenpeace needs new strategies to address changing political conditions associated with the toothfish fisheries. However, Greenpeace continues to support global governance initiatives; influencing improvements in management and conservation for the high seas toothfish fisheries; advancing CCAMLR's operational structure particularly with regard to the perceived inadequacy of the consensus decision-making process; and prompting strategies that include all stakeholders in the toothfish management processes. In addition, Respondent 36 argues that ENGOs generally need to consider cultural differences when establishing offices internationally and designing campaigns to conserve and protect the toothfish. For example, the establishment of Greenpeace offices in Japan was difficult because the

²⁴³ Greenpeace also operates the campaign vessels *Rainbow Warrior* and *Esperanza*. During the late-1980s and early-1990s, it operated the campaign vessel *Greenpeace* to (Respondents 36 and 41).

organisation lacked local credibility. Despite this constraint, Japanese society is changing and Greenpeace is slowly influencing marine issues in Japan (other than those relating to whales). For Respondent 36, it is more effective to campaign in newly targeted States through local environmental groups. For example, Greenpeace and ASOC successfully campaigned in South Korea through local Korean ENGO groups.

6.3.4 World Wide Fund for Nature (WWF)

Established as the fund-raising wing for the IUCN in 1961, WWF remains co-located with the IUCN in Gland, Switzerland. It is the world's largest independent ENGO with around five million supporters, a global actor-network of 27 national conservation organisations and 21 offices (*Interenvironment.com*. 2004).²⁴⁴ WWF campaigns on global fisheries, mining, agricultural issues and climate change, and draws on considerable resources translated from memberships, government grants and philanthropic trusts (Bergesen & Parmann 1997; Park 1997; WWF 2005a). It was created by individuals concerned about the *gap* between conservation and resource use the apparent inability of existing ENGOs to tackle them (Boardman 1981), and takes a "middle of the road" approach to environmentalism (Respondent 25).²⁴⁵ WWF's involvement in Antarctic and Southern Ocean affairs is linked to one of the organisation's founders, Sir Peter Scott, when he successfully enrolled WWF into a campaign to protect the region in the 1980s (Darby 1994). This organisation then initiated the *Endangered Seas Campaign* in 1995 and became actively concerned about the commercial extinction of Patagonian toothfish stocks and stopping IUU fishing in the fishery from this time onwards.

WWF campaigners combine scientific research, conservation and policy work with capacity-building and environmental education to conserve the natural, biological and ecosystem diversity of the Southern Ocean by promoting sustainable and renewable marine living resources (see *Canada News Wire* 2003; *Interenvironment.com* 2004). The organisation has a centrally-directed collaborative policy-based organisation although national groups are involved in policy discussion (Respondent 52). To further its conservation objectives, WWF identifies opportunities and partners including government ministers and officials, industry operators, other NGO groups or scientists.²⁴⁶ Information is then circulated to these partners. For example, WWF disseminates information on fisheries issues to the IUCN and WWF supporters via the website, *Wildlife News*, and to the media by circulating media releases.

²⁴⁴ WWF was established by Sir Julian Huxley, the first Director General of UNESCO (WWF 2005a).

²⁴⁵ WWF responded to the general public's concern over the loss of large iconic species (such as whales, tigers and pandas) and at the time, used an "us and them strategy" (Respondent 52).

²⁴⁶ Respondent 63 also identifies that WWF is respected for their efforts in the North Pacific fisheries. For example, Alaskan fishers cooperated with WWF to supply Russian fishers with fishing information and longline equipment (such as tori lines, weighted longline systems, telemetry equipment to track seabirds, and seabird guides translated into Cyrillic) to improve fishing procedures and reduce seabird bycatch.

Respondent 52 considers that WWF has been very successful in its efforts to promote sustainable Patagonian toothfish policy and stop IUU fishing activities in government arenas. WWF is an ASOC member and its campaigners attend CCAMLR meetings as part of the United Kingdom and New Zealand delegations. Other campaigners work outside CCAMLR and lobby delegates informally, and have provided input into FAO fisheries fora, the FAO Technical and Experts Working Group which developed the UN Fish Stocks Agreement and IPOA-IUU and Australia's NPOA-IUU. In addition, WWF had a representative on the ISOFISH Board when that ENGO was operating, and became an official member of the Australian SouthMAC Committee in 1998. Respondent 52 also highlights the success of WWF campaigners in mobilising the support of the Hon. Ian Campbell, Australian Federal Parliamentary Secretary on Antarctic Affairs and the Hon. Robert Hill, Australian Federal Environment Minister in 1996, in directing the AAD to initiate the Australian CCF at the national level.²⁴⁷ The CCF has since met three times per year, providing a mechanism for Australian Government officials, toothfish fishers, NGOs, other groups and researchers to work collaboratively within their own actor-networks on Southern Ocean marine living resource issues (Sections 2.5.1 and 4.4.7).

Overall, WWF fosters partnerships and enrolls other stakeholders where its campaigners have successfully worked with other ENGOs on Antarctic and Southern affairs. They have associated with ASOC, Greenpeace, TRAFFIC and HSI, government officials and fishers to develop management and industry-led strategies to protect the toothfish fisheries. However, it also works alone, conducts its own strategic planning and actions, and holds a singular opinion on certain issues. For example, WWF does not support the ASOC-led *Toothfish Moratorium* (Respondent 52).²⁴⁸ Nonetheless, WWF supports CITES action to protect toothfish species, strengthening of the CCAMLR CDS, the establishment of the cVMS, a centrally held electronic blacklist of IUU vessels, and action to stop unregulated fishing for toothfish outside the Convention Area.

6.3.5 International Southern Oceans Fishing Industry Clearing House (ISOFISH)

Among its most noteworthy achievements following the 1997 CCAMLR XVI meeting in Hobart, Australia, and with the support and funding of other ENGOs, industry members from several States and the Australian Government, ASOC was instrumental in constituting the ISOFISH (see Fallon & Kriwoken 2004). This actor-network represented an important alliance between traditional adversaries. It was born out of the

²⁴⁷ At the inaugural meeting, Australian fishing industry operators and NGOs wrote a joint letter to Prime Minister John Howard and other Federal Ministers requesting that the Australian Government deal with the problem of IUU fishing in the Australian HIMI fishery as a priority (Respondent 52).

²⁴⁸ This point is underscored by Leipold (2000), who argues that NGOs coalition members are not bound by organisational decisions and dissenters are free to take individual positions on policies. In this sense, coalitions may compromise the position of individual NGOs, be slow to act and tend to create positions that reflect the need for internal compromise rather than relevance to all its members or the outside world.

confidence of ISOFISH Coordinator, Alistair Graham, an environmental activist from the TCT and WWF, and Murray France, a fishing representative and principal of the Freemantle fishing company Kailis & France based in Australia, that they could assist governments to *fix* promptly the IUU fishing problem. Woolford (1999: no page) reported that “if the slaughter of Patagonian toothfish and albatross in the vast Southern Ocean is stopped in time, the main reason may be a little Hobart agency ... setting new boundaries in green politics.”

So successful was ISOFISH in raising awareness about IUU fishing among stakeholders that it provided a useful counter-forum to CCAMLR discussions and outcomes relating to stopping IUU activities. Its members were able to expose information that CCAMLR members were unable to provide for often defensible legal reasons. CCAMLR members and States were pressured by ISOFISH to develop regulatory initiatives that contributed to the subsequent decline in IUU fishing from a peak in 1997 to more moderate levels in 1999/2000 (see Fallon & Kriwoken 2004). In early 2001, ISOFISH wound down its campaign, having achieved measurable success in pressuring “governments all over the world to take some seriously *courageous* steps in pursuit of sustainable fisheries and albatross survival” (TCT 2001). According to Respondent 38, IUU fishing by Norwegian, Chilean, and Spanish fishers was demonstrably in decline at that time and CCAMLR members were in a better position to control both their maritime fishing zones and IUU fishers.

As an ENGO, ISOFISH collected, collated, analysed, verified and disseminated information and reported on longline fishing in the Southern Ocean (Kock 2001). Over a three-year period, its campaigners reported publicly on IUU activity because they were convinced that they could assist governments to address effectively IUU fishing. Like ASOC, they drew upon the plight of the albatross (and the albatross research completed by Brothers [1991] calculating the threat of longlining to seabirds) to attract media and public attention because they realised that seagoing nations would be reluctant to sanction actions that risked albatross bycatch resulting from longlining. Given that the ENGO, BirdLife International, was able to mobilise considerable public concern to save albatrosses, ISOFISH redirected its campaign toward the toothfish.

ISOFISH aimed to find measures to deal with the limitations of governmental power and add value to government efforts to curb IUU fishing. Campaigners openly discussed controversial or potentially libellous issues upon which governments were unable to act. They also took action on issues where CCAMLR members were unable to reach a consensus. In addition, they actively designed a campaign to develop an “environment of engagement” by welcoming the fishing industry to contribute information; identifying fishing rivals and publicly naming and shaming illegal fishing operations; compiling a rogues list of fishing operators known as the report titled, *The Good, the Bad and the Ugly* (or the *Rogues Gallery*); exposing illegal fishing bases; and keeping illegal fishers on the run (ISOFISH 2002b; Respondent 38). Campaigners also designed

a media strategy with the capacity to disrupt the illegal fishing community; encouraged other NGOs to assist the campaign; and distributed information to governments and appropriate agencies to assist them to eliminate IUU toothfish fishing activities (Fallon and Kriwoken 2004). ISOFISH also produced significant commentaries on IUU activity from Norway, Mauritius, and Chile, and three reports on how operators change vessel names and ports of registration to avoid legal requirements such as the CDS, in an effort to publicly embarrass rogue operators (ISOFISH 1998a, b; 1999b).

The most notable achievements of ISOFISH included reporting the arrests of suspected IUU operators, publishing the activities of unlicensed longline fishing vessels in the Convention Area, exposing the questionable international commercial arrangements supporting IUU activities such as those between the Norwegian Bergensbanken Bank and the owners of the *Aliza Glacial* (Section 5.3.2);²⁴⁹ and establishing informal partnerships with the media, including News Limited, publisher of *The Australian*, and the fishing industry (Fallon & Kriwoken 2004; ISOFISH 1998b, e; Woolford 1998; 1999). ISOFISH also directed information to foreign journalists including those in the Faeroe Islands and Norway. Subsequent Australian reporting, together with media coverage in the Faeroe Islands, led to Patagonian toothfish poaching gaining prominence and criticism worldwide (Respondent 38).

ISOFISH largely achieved its aims. It effectively acted as a catalyst to prompt international organisations and States to modify their regulatory regimes and use sea surveillance and patrols, port closures, State control over nationals, market exclusion and punitive penalties to save Patagonian toothfish stocks and to reduce the incidental bycatch of seabirds and non-target marine species that results from longlining operations (Fallon & Kriwoken 2004). The campaign was accomplished by demonstrating that one small environmental pressure group such as ISOFISH had the capacity to *hurt* the illegal fishing industry at an international level by documenting illegal fishing operations, embroiling illegal fishing operators in a personal level of discomfort; and making individuals within the fishing industry feel they were part of an industry that had global environmental responsibilities. To demonstrate its global reach, ISOFISH successfully exposed illegal toothfish poachers from the Faeroe Islands. The ENGO then opportunistically targeted allegedly illegal toothfish poachers from Norway, illegal traders based in Mauritius, major traders and consumers from Japan, and finally Spanish fishers and traders (Respondent 38) because Spain was reportedly a key IUU fishing culprit at that time (Greenpeace 2000a).

²⁴⁹ ISOFISH (1998b, e) criticised Australian fisheries law and considered it a "loophole" that the law allowed the *Admiralty Act 1988* to be successfully activated by the financial backers of an allegedly illegal fishing operation to extract a vessel from arrest under a coastal State's national fisheries legislation. This "loophole" almost eliminated the commercial risk of losing a vessel, despite, as in this case, the vessel already being under arrest by Australian authorities (Woolford 1998).

6.3.6 Trade Records Analysis of Flora and Fauna in International Commerce (TRAFFIC)

TRAFFIC extends to more than 150 States and is based in Cambridge, England. It was established in 1976 by the IUCN and WWF after CITES was ratified in 1975 and continues to be sponsored by these ENGOs (*Interenvironment.com* 2004). This low-profile but relatively stable actor-network monitors trade in wild animals and plants, aims to stop illegal trade in these species and encourages the implementation of the CITES (Respondent 69). In this respect, TRAFFIC is different from other ENGOs because it focuses only on trade issues and works autonomously.²⁵⁰ Because TRAFFIC does not have a subscriber membership base or the need to attract new memberships and revenue, there is not the same imperative to conduct direct advocacy work or actively mobilise the media to get its messages across to the general public. Its campaigners connect with a wide range of other actor-networks, attend CCAMLR meetings as IUCN observers and contribute to constructive policy debate in national fora such as the Australian CCF meeting where its focus is trade in toothfish species (Respondent 69).

TRAFFIC entered the Patagonian toothfish debate in 2001 due to concerns about the increasing levels of IUU fishing and the inability of fisheries managers to conserve this species (TRAFFIC 2003a). The actor-network strove to translate independent and technical trade analysis into highly regarded international trade documents such as the Lack and Sant (2001) report titled *Patagonian Toothfish: Are Conservation and Trade Measures Working?* This report is considered one of the first attempts to analyse toothfish trade that suggests that actual catches were in excess of those recorded by CCAMLR members.²⁵¹ Other documents such as the *TRAFFIC Bulletin* and *Species in Danger* are additional to an Internet website (TRAFFIC 2001a, b; 2003a, b; 2004).

Despite the support for TRAFFIC's trade analyses from other actor-networks, there has been resistance to the actor-network's work shown from certain individuals from ASOC and especially to TRAFFIC entering the toothfish debate. She explained that up until early 2000, the *NGO Sub-network* involved in CCAMLR discussions was a *closed shop* and there was concern that if other ENGOs entered the toothfish debate they might threaten ASOC if they campaigned outside this coalition. However, TRAFFIC has chosen not to enter into external coalitions because its campaigners may not control the output of the coalition. For example, TRAFFIC has never been an ASOC member nor has it supported the ASOC-led *Toothfish Moratorium* (Respondent 69).²⁵² Some of

²⁵⁰ TRAFFIC's program priorities include threatened species (to ensure that wildlife trade does not endanger wild animal and plant species); conservation (to ensure that wildlife trade does not threaten the integrity of ecoregions); trade and resource security (to ensure the security of wildlife resources of particular value for food and medicine); and promoting international cooperation (TRAFFIC 2003a).

²⁵¹ However, its authors failed to take sensitive sovereignty issues regarding the Falkland Islands into account and consequently the Argentines disregarded its merit (Respondent 25).

²⁵² TRAFFIC has not publicly commented on its position regarding the ASOC led *Toothfish Moratorium* or blacklisting of vessels, nor has it made any submissions to CCAMLR members on these issues.

these concerns may have been legitimate if the ENGO effort were perceived as being fragmented, dissipated or fractious but according to Respondent 69, this outcome has not eventuated and the trade analyses conducted by TRAFFIC complements the efforts of other ENGOs and groups working on broader marine issues. In addition, TRAFFIC supports CCAMLR conservation measures for the Patagonian toothfish, CITES action to protect toothfish species, strengthening the CCAMLR CDS and establishing the cVMS, the blacklisting/whitelisting of vessels in the toothfish industry. This organisation also provides expert and independent trade analysis that other actor-networks are unable to provide because trade analysis is not their area of expertise.

6.3.7 Marine Stewardship Council (MSC)

MSC was founded in 1996 by WWF and Unilever (arguably the world's largest buyer of seafood) as a global green-business partnership and became fully independent in 1999 (Hermes & Mikalen 1999; Scientific Certification Systems Inc. 2005; Tarica 2004; Wessels 1999). It is based in London, the United Kingdom, it is an industry NGO (INGO) because it receives significant funding from industry sources. The INGO also forms scientific and environmental partnerships that include mobilising a broad actor-network of supporters from over 100 organisations in more than 20 States. MSC officers foster a multi-stakeholder partnership approach, taking into account the views of fishers, traders, government representatives, ENGOs and consumers (MSC 2002a). It also follows the International Standards Organisation (ISO) processes and standards for an accreditation-certification system,²⁵³ and has established *Principles and Criteria for Sustainable Fisheries* (MCS 2002b) that form the standard against which fisheries are assessed based on the CCRF (ISO 2004: Moody Marine Ltd 2004).²⁵⁴

MSC seeks independence from governments and transparency in its operations (Wessels 1999), promotes equal access to its voluntary certification and eco-labelling program irrespective of the size, scale, type, location or intensity of a fishery, and respects the long-term interests of fishers and communities dependent on the fisheries (MSC 2002a).²⁵⁵ Its officers supervise third party certification of fisheries as sustainable and well-managed so that products containing species harvested from these fisheries can

²⁵³ ISO seeks independence between the group responsible for setting the standard and providing clear guidance and process, and the group that assesses whether an operation meets that standard.

²⁵⁴ MSC Principle 1: A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery. MSC Principle 2: Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends. MSC Principle 3: The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable (see MSC 2002b).

²⁵⁵ MSC is not unduly affected by the WTO due to its independence from government (Wessels 1999). However, if governments decide to begin regulating eco-labelling to ensure labels are authentic, then the WTO could intervene if it were proven that domestic and imported products were treated differently.

be marked with an on-pack eco-label (MSC 2002a; Respondents 39 and 45).²⁵⁶ MSC also brings independent fisheries experts together in a Technical Advisory Board to set standards, guidelines and accreditation methodology (Respondent 61).

For Respondent 39, the role of the MSC in helping to manage and conserve fish stocks and associated ecosystems is threefold. Firstly, it has created a standard (*technology of performance*) against which fisheries can be certified as well-managed and sustainable, thereby providing consumers with the *best* environmental choice in seafood. By creating consumer demand for eco-labelled seafood products, MSC seeks to pressure demand in the marketplace and influence preferential purchasing by processors, traders and consumers. As such, this organisation seeks to squeeze fishers, processes and traders operating unsustainably out of the marketplace or pressure them to improve their environmental performance. Secondly, fishers must be committed to continuous improvement (a concept enshrined within sustainability as well as international certification including the ISO standards 61 and 62 that MSC embodies).²⁵⁷ Each fishery must pass a minimum standard, although they also have conditions placed upon them in the form of *corrective actions* in order to reach *best practice* in the fishery. Conditions on certified fisheries can then contribute to ecosystem-based fisheries management as more data about fisheries and ecosystem interactions comes available. Thirdly, fish carrying the eco-label must ensure chain-of-custody certification to guarantee traceability of fish products through the supply chain from vessel to table. Chain-of-custody certification could become a powerful instrument for toothfish products because consumers will be able to purchase fish from a sustainably managed fishery and fishers will be further *incentivised* to maintain certification. Eco-labelled toothfish products have yet to enter the marketplace.

Eight fisheries have been certified under the MSC program including the South Georgia Patagonian toothfish longline fishery.²⁵⁸ MSC became involved in the toothfish debate in 2001 when it initiated the certification assessment of this fishery on behalf of the Government of SGSSI (Moody Marine Ltd. 2004; Tarica 2004).²⁵⁹ Although this fishery represents less than 10 per cent of the worldwide catch of toothfish (Bruchmann 2004), the MSC hopes that this certification process will complement other initiatives being undertaken by RFMOs, national governments, industry operators and ENGOs to manage, conserve and protect it (Tarica 2004). Fishery certification was awarded in March 2004 by the MSC private industry certification body, Moody Marine Ltd., after a

²⁵⁶ The MSC is the Accreditation Body that accredits independent Certification Bodies to assess applicant fisheries to determine whether they meet the MSC *Principles and Criteria for Sustainable Fishing*.

²⁵⁷ This is a concept that is enshrined within sustainability as well as international certification processes and management systems such as ISO standards.

²⁵⁸ MSC certifications comprise approximately four per cent of the world's fisheries and include Western Australian rock lobster (*Panulirus Cygnus*), Alaskan pollock (*Theragra chalcogramma*), Alaska salmon (*Oncorhynchus* sp.) and New Zealand hoki (*Macruronus novaezelandiae*) (see Brown 2004). Thirteen other fisheries are undergoing assessment, and 40 other fisheries are at various points in the MSC process.

²⁵⁹ Strategic assessment of toothfish fisheries under Australia's EPBC Act are similar, although they are second party assessments where the Australian Government sets the standards and assesses the fisheries.

two and a half year scientific review and the conclusion of outcomes by an Independent Objections Panel (Bruchmann 2004; MSC 2005). Prior to the certification, meetings with external stakeholders were held in the Falklands Islands in 2001 and included local stakeholders, industry operators and ENGO representatives.²⁶⁰

6.3.8 National Environmental Trust (NET)

NET is an ENGO that has become influential in Antarctic and Southern Ocean affairs over the past five years. Based in Washington DC, the United States, NET launched its activities in 1994 to inform the general public about environmental problems and how they affect the health and quality of life.²⁶¹ The organisation is well financed and takes direct action when warranted whilst maintaining alliances at the political level and contributing to constructive policy debate (Respondent 44). It operates in a manner similar to Greenpeace at the activist level and like WWF at a more diplomatic level *behind-the-scenes*. NET has a formal board structure to ensure transparency and its campaigners mobilise education strategies, modern communication techniques and scientific research to translate complex environmental issues into more easily understood information to inform the community (NET 2005: no page). In particular, they mobilise the media to get the *right* stories into newspapers and television by being well informed, building relationships with media staff and providing information that is timely and reliable by translating texts in the form of press releases, memos, email updates or background information (Respondent 65).

As part of its overall campaign, NET sought to develop a marine campaign (Respondent 44). Consequently, NET hired Gerry Leape (from Greenpeace) to develop the campaign given his expertise in marine, Southern Ocean and Antarctic affairs. Based on his recommendations, NET focused attention on the toothfish and the problems of IUU fishing in the toothfish fisheries. In addition, NET became an ASOC member and in partnership with ASOC and with financial assistance from the David and Lucile Packard Foundation, launched the *Take a Pass on Chilean Sea Bass* campaign in early 2002 at San Francisco's Farallon restaurant (ASOC 2002d; Daspin 2004; Fleshler 2005; Lewy 2004) as a means for achieving ASOC's call for a *Toothfish Moratorium* on fishing and consumption (Brownstein *et al.* 2003; NET 2004a Shaffer 2003; *The Associated Press* 2002). The launch received wide television, radio and print media coverage. According to NET (2004d: no page), "the national campaign now covers the country's major food and dining markets, including Chicago, Philadelphia, Washington DC, Los Angeles and New York City." For Respondent 44, the campaign sought to focus on the toothfish and IUU fishing in this fishery because "it provided an excellent example that could be extended to other global fisheries because it has so many fishing

²⁶⁰ ENGO representatives included Falklands Conservation, ASOC, WWF and NET. Additional written responses were received from Greenpeace, BirdLife International, National Audubon Society and SCOR.

²⁶¹ NET gained prominence in 1995 when it mounted a substantial education, advertising and media campaign to alert Americans to unprecedented cuts in environmental safeguards in the United States.

issues that impact on other global fisheries in terms of over-fishing, IUU fishing globally and the problems associated with developing a new (under-utilised) fishery when commercial fishers 'discover' a valuable stock." The media campaign has been successful in the United States in raising public awareness about the problem of IUU fishing in the toothfish fisheries (Respondent 44).

NET campaigners now attend CCAMLR as members of the United States delegation. They are also redirecting their efforts from environmental campaigns focused on issues within the United States to global issues such as researching and highlighting trade in toothfish products and its implications on legal and illegal operations. In this regard, NET released a trade report in 2004 titled *Black Market for White Gold: The Illegal Trade in Chilean Sea Bass* to alert traders, restaurateurs and consumers that they may be unwittingly selling, serving or consuming illegal toothfish products (NET 2004c). This report concludes that significantly more toothfish is imported into the United States than is officially reported to the American Government due to misrepresentation and mislabelling of toothfish products, confusing shipping codes and the laundering of illegally caught and traded products.

6.3.9 Coalition of Legal Toothfish Operators (COLTO)

In response to the challenges of managing toothfish stocks and stopping IUU fishing activities, there formed in Australia a group known as COLTO. This INGO launched its activities in 2003 and it is an alliance of fishing companies legitimately licensed to fish for toothfish that are also fishing in compliance with international/national fisheries measures. As such, these fishers have re-enrolled in the *COLTO Sub-network* to reconfigure the power they are able to exert as a collective. In this light, COLTO members are intent on eliminating IUU fishing for toothfish by exerting significant pressure on governments, CCAMLR members, residents of communities dependent on the fishery, and toothfish consumers as well as their peers engaged in IUU fishing. Respondent 12 explains that this non-profit coalition was constituted because the legitimate operators considered that governments and the international community "hesitated" in taking effective action against IUU fishing for toothfish and were clearly "losing the battle against IUU fishing." Overall, COLTO attempts to influence the three key mechanisms of governance: governments, the marketplace and the "informed-public" which may, or may not, be represented by ENGOs.

In 2003, COLTO comprised 24 separate company stakeholders representing more than half of all licensed Patagonian toothfish production from 10 States that include a French fishing syndicate and fishers operating in Falkland Islands maritime zones under the jurisdiction of the United Kingdom (COLTO 2004a). On writing of this dissertation, COLTO represented nine States and 20 separate companies (see COLTO 2005). Membership changes are because new companies have joined COLTO. However, South African companies amalgamated to form one membership, the Pescanova fishing

conglomerate has organised its separate operations in Spain, Chile, Argentina, Namibia and Uruguay into one group, and other companies have ceased operation or have cancelled their membership.²⁶² All licensed fishers interviewed in this study are, or have been, COLTO members (Appendix E).

No presumption is made about the legitimacy of any of these companies' past fishing activities, only that they are currently increasingly committed to fishing in accordance to their licence provisions. What can be said is that some COLTO members form part of the world's wealthiest toothfish fishing operators, and the coalition's capacity to stimulate change in the industry may prove considerable. This prowess is highlighted by the start of a US\$100,000 *Wanted Campaign* to attract any credible information leading to the capture and/or conviction of IUU toothfish fishers, companies, directors, or employees (COLTO 2003b; 2004a; Exel 2004a). COLTO members emphasise that IUU fishing threatens the livelihoods of licensed fishers as well as toothfish populations and ecologically associated species. They also understand resource management and the economic constraints that impact on their individual operations and, they have, to varying degrees, invested in particular environmental ethics and sustainability practices.

In 2004, COLTO announced its intention to apply to the Commissioner for Fair Trading in Western Australia to become an incorporated association, and is undertaking formal legal processes to have this approved (COLTO 2005). Gaining formal NGO status will be an achievement because members come from many States where corporate law is very different from that in Australia. Members will also need to change how they conduct business and make their performances calculable, rather than continuing as a loose coalition of legitimately licensed operators. However, COLTO will continue to support governments and ENGOs because its members recognise that these stakeholders have contributed to COLTO's success (Exel 2003).

Like ISOFISH before it, but with more resources to back its ventures, COLTO promotes legal fishing that is environmentally responsible under current national and international policies and management standards. It aims to deal with the limitations of governmental power; add value to government efforts to curb IUU fishing; and work with conservation groups to publicise and identify IUU operators, their companies, vessels, individuals and trading names in order to sustain its members' livelihoods as well as toothfish and seabird stocks (COLTO 2004b). By enrolling intermediary actor-networks such as the media, financial incentives and input into policy debates, COLTO is able to raise public, controversial and potentially libellous issues that governments cannot or

²⁶² For example, Nippon Suisan Kaisha Ltd (Japan), Varepi S.L. (Spain), Globalpesca S.A. (Chile), Grupo Regal (Spain) and Pesquera Guomar (Spain) joined COLTO (see COLTO 2005). Novagroup Pty Ltd and Suidor Fishing Pty Ltd amalgamated with Irvin and Johnson (South Africa) and currently pay one membership fee. The Pescanova Group also amalgamated Argenova S.A. (Argentina), NovaNam Ltd (Namibia), Pescanova S.A. (Spain), Pesqueris Belnova S.A. (Uruguay), and Pesca Chile S.A. (Chile) and currently pays one membership fee. Bato Star Fishing Pty Ltd (South Africa) stopped fishing for toothfish due to problems obtaining general fishing licenses in South Africa.

will not engage in normally. It has gone beyond other NGO actor-networks into the heart of industry because its members have credibility in that context and have significant potential to influence the actions of IUU operators and the marketplace where toothfish are eventually sold.

COLTO advises national fisheries managers, works with authorities to remove legal loopholes that enable unregulated toothfish operations to continue, and conducts sea surveillance to monitor IUU fishing activities (COLTO 2004a). It has employed an information officer, developed an access database and established an Internet website to disseminate information about the toothfish fishing industry and IUU fishing activities (Respondent 13). COLTO is also considering a professional eco-marketing approach to the sale of legitimately caught toothfish by differentiating its products from other products harvested by fishers who are not COLTO members, operates an international free-call centre where members of the public may securely provide information on IUU fishing, and as mentioned, offers substantial financial rewards for valuable information.

Actively participating in a sustainably managed fishery motivates licensed fishers that are COLTO members. They create the discourse that IUU fishing threatens their livelihoods; that they need to unite to pressure IUU operators to conform to international systems of governance; and that their collective actions may promote more equitable allocation of high seas access rights. These fishers underscore their willingness to work multilaterally to ensure that licensed fishers are protected and IUU fishing eliminated. In this vein, Respondent 11 describes COLTO as “the first international toothfish operators’ coalition to fight against poachers everywhere.” By joining the stable and durable actor-network of COLTO, members gain the solidarity and political strength that are often embedded in actor-networks *per se*; this is exemplified in a reference by Respondent 10 to “safety in numbers” in the fight against IUU operators. Indeed, the instrumental value of the COLTO alliance is paramount in protecting legitimate operators from those who are *free riders* and benefit unfairly from the sacrifices made by those who actively comply with fisheries management and conservation measures (see Balton 2004; Exel 2004a).

COLTO has become a widely respected international organisation in industry, government, and INGO and ENGO arenas because its members are able to say things that CCAMLR members or government officials are legally or technically unable to voice (Respondents 26, 29, 57, 66 and 69). For Respondent 49, COLTO’s work is “probably the best we have got in terms of vessel and trade information ... because they are operators in the system ... have a good handle on the market and have been fairly transparent about disclosing material.” It is now a recognised force in Southern Ocean affairs and plays multiple roles as an advocate for the licensed toothfish fishing industry and an organisation capable of influencing industry and government decisions in its effort to curb IUU fishing and promote sustainable fishing practises. Regardless of the legitimacy of many of its members’ fishing activities, COLTO members act as one,

have aligned themselves and intermediaries, and have become a powerful actor-network because they are able to enrol, convince, enlist and represent others. Therefore, COLTO is held as a black box by many actors and the *COLTO Sub-network* has become so stable that it is considered as fact and has become normalised (see Latour 1987; Law 1986; Murdoch 2000).

For example, in 2003 the coalition released the *Rogues Gallery – the New Face of IUU Fishing for Toothfish*, which named and shamed suspected IUU vessels active since 2002 (COLTO 2003c). COLTO members have also attended CCAMLR as part of the Australian, French, Japanese, New Zealand and South African delegations, and are members of national policy fora such as the Australian SouthMAC, CCF and SARAG meetings. In October 2003, and on morning of the first day of the twenty-second CCAMLR meeting in Hobart, Australia, CCAMLR members approved COLTO's request to attend the meeting as an official NGO observer (Exel 2003). This outcome illustrates how the *COLTO Sub-network* becomes *punctuated* when it is converted into a single node in the *CCAMLR Sub-network*. As a CCAMLR observer, COLTO has submitted information papers to CCAMLR in an effort to influence the toothfish debate and has more recently employed a "low profile" strategy to reduce tensions between the fishing industry and CCAMLR members (Respondent 12). This strategy has proved successful and CCAMLR members have since agreed to include this INGO on the automatic invitation list that is prepared prior to CCAMLR meetings and they treat COLTO in a similar manner to other *ongoing* official observers such as ASOC, FAO, IUCN and IWC (CCAMLR XXIII 2004a §18.2). In addition, COLTO (along with other ENGOs including WWF and TRAFFIC) was invited by the OECD to participate in sessions of the 2004 *Ministerial-led High Seas Task Force on IUU Fishing* and has developed a reputation for supplying and distributing accurate and otherwise inaccessible information on known IUU fishing activities from the secretive toothfish fishing industry. Its members have also provided scientific data to the research community (for example: toothfish morphological data, bycatch statistics and trade information), and significant expertise to developing new technologies to reduce environmental impacts. Despite these achievements, COLTO members recognise that stopping IUU fishing is difficult and they work with CCAMLR and its members locally and globally to curb these activities.

6.3.10 Sea Shepherd

Some NGOs act in an overtly dissident manner with regard to other actor-networks in the *NGO Sub-network*. One such organisation is Sea Shepherd, an ENGO that was founded by Paul Watson (ex Greenpeace co-founder) in 1977 (Sea Shepherd 2006) after he was expelled from Greenpeace over disagreements about campaign tactics (Wikipedia. 2005d). Based in Washington DC, the United States, this militant and direct action organisation is more aggressive than Greenpeace and sharply contradicts the view of Arts (2004) who argues that all NGOs act non-violently. For example, Sea

Shepherd campaigners have undertaken provocative marine conservation actions that some critics have labelled as vigilantist, unlawful and ecoterrorist actions. Actions have included conventional protests, armed boardings of vessels in international waters, scuttling and sinking of illegal fishing vessels, ramming illegal whaling vessels, acts of sabotage against vessels in harbour and the confiscation and/or destruction of illegal fishing gear at-sea. Sea Shepherd has also conducted intense direct action and media campaigns mainly directed towards patrolling the waters around the Galapagos Islands, Japanese whaling and Canadian sealing. Respondent 67 describes Sea Shepherd as:

The *ladies of the night* of the conservation movement ... even when other organisations agree with us they are reluctant to be seen associating with us ... because we are an action-orientated intervention organisation ... with a reputation for sinking ships and confiscating drift nets and longlines – all necessary and legal activities by the way as we only target illegal activities.

According to Sea Shepherd (2006: no page) it works alone “to conserve and protect the world’s marine wilderness eco-systems and marine wildlife species” and its mission is accomplished by upholding and enforcing international treaties, laws and conventions and through education, investigation, documentation and enforcement campaigns. Campaigners are guided by the 1982 *United Nations World Charter for Nature* under Sections 21-24 that provide authority to individuals to cooperate with, act on behalf of, and enforce, international conservation laws (UN 1982; Sea Shepherd 2006; Wikipedia 2005d).²⁶³ Sea Shepherd enforces international marine conservation law using two campaign vessels *Farley Mowat* and *Sirenian*. For Respondent 67, the strength of Sea Shepherd is its willingness and nerve to aggressively intervene with action using these vessels, but it is “hampered by a lack of funding and external support and assistance.”²⁶⁴

Sea Shepherd became engaged in the toothfish debate in late 2003 when the *Farley Mowat* patrolled the Ross Sea principally in search of Japanese whaling fleets. Despite being concerned about illegal fishing activities globally, Watson and his activist crew onboard the *Farley Mowat* knew little about the toothfish, the impacts of IUU fishing activities in these fisheries and the role of CCAMLR in managing and conserving Antarctic marine living resources. They learned about these issues from me during their re-supply visit to the Port of Hobart in Australia prior to the summer campaign. They subsequently redirected some of their activity to monitoring IUU toothfish vessels but failed to approach relevant actor-networks prior to their campaign to ask where IUU toothfish vessels might be located (Respondent 41). My influence here underscores the point that I unintentionally became embedded in the *Patagonian Toothfish Network* and

²⁶³ The 1982 *United Nations World Charter for Nature* reaffirms the maintenance of international peace and security and advocates that nature be respected and its essential processes not impaired (UN 1982).

²⁶⁴ Despite the hostility directed towards Sea Shepherd, it has working agreements with Ecuador, Costa Rica, Trinidad, Tobago and Indonesia to help these States fight illegal fishing, and has previously worked with the United States Government against illegal fishing (Wikipedia. 2005d). It also has many influential corporate sponsors including Paul Mitchell Systems and Patagonia, Inc. and other influential celebrity supporters (Sea Shepherd 2002; 2006; Wikipedia. 2005d).

NGO Sub-network after asking Sea Shepherd to become involved in my research and influenced their campaign strategy by providing information. In this regard, my actions may have compromised the objectivity of this component of the study but also highlights my increasing influence as an actor in these actor-networks.

After a month at-sea, the Sea Shepherd crew failed to sight a whaling vessel. However, they intercepted and checked the legality of two suspicious toothfish fishing vessels and reported them to government authorities in Australia and New Zealand including CCAMLR (via third-party email correspondence through me). CCAMLR officials subsequently confirmed that the Australian/New Zealand-flagged longliner *Janas* and the Russian fishing vessel *Yentar* were fishing in accordance with CCAMLR conservation measures. Respondent 67 expresses his disappointment about the lack of government or CCAMLR assistance in providing information identifying where IUU vessels might be located. Given Sea Shepherd's aggressive activities, it is not surprising that assistance was not forthcoming because the sinking of vessels in Antarctic waters, whether the crews act legitimately or illegally, can result in the loss of life.

Respondent 67 acknowledges that without the assistance of other actor-networks, it is not possible for Sea Shepherd to intercept effectively or stop IUU toothfish fishing vessels. This point illustrates that actor-networks can become stronger in response to their ability to enrol, convince, enlist or represent others. It also illustrates that the failure of Sea Shepherd to associate with other actor-networks in the *Patagonian Toothfish Network* and work through a common OPP may result in this organisation becoming dispensable in the actor-network (see Callon 1986; Kendell & Wickham 1998). Nonetheless, Respondent 67 maintains that "until the true threat is realised ... and governments take decisive action to control their fishing activities and protect marine resources", Sea Shepherd will continue its aggressive campaign.

6.4 Other NGOs in the actor-network

Other influential NGOs emerge in the *NGO Sub-network* include SCAR, ICFA, SARPC, BirdLife International, SSS, HSI, BOI and Monterey Bay Aquarium (MBA). These NGOs are detailed in Table 6.2 and are examined thematically (except for SCAR, which was detailed in Section 3.5.2). One such INGO is ICFA. Founded in 1988 and based in the United States, ICFA enrolls influential international and national fisheries associations in an actor-network to represent the interests of commercial fishers and seafood operators from 18 States (ICFA 2003). This association recommends that the fishing industry implements the CCRF, and that industry, governments and *responsible* ENGOs and INGOs define practicable procedures, regulations and mechanisms to implement sustainable use principles. For example, it supports science-based conservation and management of fishery resources, the maintenance of ecological systems and improved economic and social well-being of resource shareholders. ICFA contributed to the IPOA-IUU and has passed 11 resolutions on issues such as non-

discriminatory eco-labelling and the establishment of MPAs (providing that States ensure a rational and justified approach to their implementation). Most notably, ICFA supports the elimination of IUU fishing and FOC vessels by all States and the establishment of catch documents to create incentives toward compliance (ICFA 2003). It is difficult to assess how active or influential ICFA is because no recent initiatives or recommendations are evident. However, I refer to ICFA members in this study, most notably the Australian Seafood Industry Council (ASIC) and Fundación Chile.

Table 6.2: Other influential pressure groups

Other ENGOs	Founded	NGO status	Funding	Key influence
SCAR (United Kingdom)	1957	Scientific NGO Semi-independent	Funding from memberships, governments and related associations	Focus on science Key contributor to the establishment of the ATS and CCAMLR
ICFA (United States)	1988	INGO Independent	Direct funding from memberships from fish and seafood industry associations, worldwide	Focus on fishers Enrols international and national fisheries associations
SARPC (La Réunion Island)	2002	INGO Independent	Funding from memberships from the La Réunion Island toothfish fishers	Focus on fishers Represents French toothfish fishers
BirdLife International (United Kingdom)	1922	ENGO Independent	Funding from The Royal Society for the Protection of Birds and supporter memberships	Focus on seabirds Launched the <i>Save the Albatross Campaign</i>
SSS (New Zealand)	2002	ENGO and INGO Semi-independent	Funding from the New Zealand Government, memberships from legitimate toothfish fishers, scientists and other NGOs	Focus on seabirds Promotes sustainable toothfish fishing practices amongst toothfish fishers
HSI (Australia)	1991	ENGO Independent	Funding from memberships, donations, sponsorships, a donor online Extinction Denied fund (monthly giving) program	Focus on animal welfare Key ASOC member Committed to stopping IUU toothfish trade
BOI (United States)	2002	ENGO Independent*	Funding from supporter memberships, corporations and foundations – government grants assist research projects	Focus on consumers Committed to changing consumer perceptions
MBA (United States)	1984	ENGO Independent*	Funding from memberships, admission fees, corporations, foundations, grants and events, revenue from its gift-and book-stores	Focus on consumers Committed to changing consumer perceptions

*Independent non-profit organisations under Section 501(c)(3) of the US Internal Revenue Service Code.
Sources: BOI (2003); BirdLife International (2004); HSI (2005); ICFA (2003); *InterEnvironment.com* 2005; MBA (2005); Respondents 46, 51 and 58; SCAR (2005)

Another INGO is the six-member French industry syndicate of like-minded toothfish fishing companies from La Réunion Island known as SARPC (Appendix E).²⁶⁵ It was established in late 2002 to pressure the La Réunion Island and French governments to support the legitimately licensed toothfish industry (Respondent 58). Syndicate members attend CCAMLR as part of the French delegation and they have considered the merits of becoming an INGO to speak with one voice to promote the legitimate fishing industry, a sustainable toothfish fishery and fishing practices to mitigate other environmental impacts such as seabird bycatch. For example, SARPC recently financed research into assessing white-chinned petrel populations on the Kerguelén and Crozet Islands that commenced in late 2004. SARPC is a member of COLTO and cooperates with other groups to find new ways to reduce environmental impacts associated with longline operations.

Seabird-focused ENGOs also exert pressure on other actor-networks in the *NGO Sub-network*. For example, after the World Conservation Congress held its first session in 1996, BirdLife International launched its *Seabird Conservation Program* in early 1997. Founded in 1922 and based in the United Kingdom, the organisation is an enduring global actor-network that attracts support from over two and half million members and other influential actors including HRH The Prince of Wales, HM Queen Noor of Jordan and HIH Princess Takamado of Japan (BirdLife International 2002c, d; BirdLife International 2004).²⁶⁶ BirdLife International has also mobilised support from the IUCN and ASOC (and ISOFISH when it was active), and collaborates with scientists, managers and industry operators to protect seabirds and to study incidental mortality (Respondent 38). Its campaigners completed a technical review of longline fisheries for the FAO in 1998 and officially launched the *Save the Albatross Campaign* in late 2000 to reduce albatross bycatch that results from longlining (see BirdLife International 2002a, b, c; 2004; 2005) (Section 5.2.3). Partly due to the pressure exerted by BirdLife International and other ENGOs, States engaged in longlining then started to mitigate seabird bycatch and experimented with underwater setting devices to keep baited hooks out of sight and reach of birds (Fallon & Kriwoken 2004). In addition, its members attend CCAMLR as part of the South African delegation, contribute to various national policy fora including the Australian CCF meeting and recently published the 2005 international review titled *Regional Fisheries Management Organisations: Their Duties and Performance in Reducing Incidental Mortality of Albatrosses*. This report ranks the environmental performance of “14 RFMOs whose areas overlap with albatross distribution, assessing their performance in fulfilling their duties to minimise bycatch, especially albatross bycatch, within their fisheries” (Small 2005: 5). Here, CCAMLR is ranked as the fifth most important RFMO in terms of albatross distribution and scored

²⁶⁵ SARPC is not technically an NGO because it is not an incorporated body and has clear industry objectives. It has six members although the seventh La Réunion Island toothfish fishing company, Pêche Avenir, is not a member and considered a “black duck” (Respondent 11).

²⁶⁶ BirdLife International was formerly known as the International Council for Bird Preservation.

highly because the conservation measures implemented by CCAMLR members have reduced seabird bycatch in the licensed fisheries by over 99 per cent since 1992.

SSS is another ENGO actively conserving seabirds. Based in Wellington, New Zealand, this actor-network between governments, fishing and eco-tourism industry operators, seabird researchers and ENGOs formed in June 2002 to cooperatively promote sustainable toothfish fishing practices through longline and trawl fishing techniques that avoid seabird mortality (New Zealand 2006; SSS 2003a).²⁶⁷ The overarching premise of SSS is that fishers hold the key to solving environmental issues in the toothfish fisheries because they have the capacity to act as good role models and facilitate the transfer of knowledge, technology and skills to other fishers (NMFS 2003; Respondent 51; SeaFIC 2003).²⁶⁸ SSS representatives actively work with fishers in Australia, New Zealand, Southern Africa, South America and the TAAF to promote responsible fishing practices and attend CCAMLR meetings on Australian and New Zealand delegations. The actor-network supports exchange projects that swap crews and technologies between international fishing fleets; developing and testing new mitigation methods to reduce seabird bycatch; establishing multi-stakeholder groups, hosting national and international fishers' fora to foster information exchange, and encouraging States to join ACAP (New Zealand 2006; SSS 2003a, b, c). SSS also employs seabird-fisheries advisors to work with fishers and produces intermediary actor-networks in the form of videos, brochures, articles, media releases and an Internet website in English and Spanish to build international awareness about seabirds (*Scoop Media* 2003; Hodgson 2003).

Animal welfare groups such as the Humane Society International (HSI) have developed extensive actor-networks of animal activists who pressure other actor-networks. Founded in 1991 and based in Australia, HSI is the largest animal protection organisation in the world with over seven million supporters. HSI activists work with the UN, governments, other ENGOs and the general public to find culturally sensitive and long-term solutions to protect animals including a commitment to stop illegal wildlife trade and other threats to endangered species (HSI 2004a, b). Although the influence of HSI is not highly visible, it provided input into the development of CCAMLR, contributes to toothfish fishery fora including the Australian CCF and actively campaigns to protect seabirds and reduce incidental mortality. In addition, as part of the global actor-network of 65 ENGOs involved in the *Species Survival Network* (SSN), and in cooperation with the Australian Government, Austral Fisheries Pty Ltd, WWF and TRAFFIC, this organisation actively supports government efforts to arrest IUU fishers. HSI also supports the Australian Government and the legitimately licensed toothfish industry (most notably COLTO) for their efforts to expose IUU fishers and

²⁶⁷ Since late 2003, SSS moved from an informal network to a charitable trust (SSS 2003c, d).

²⁶⁸ The Hon Pete Hodgson, New Zealand Minister of Fisheries, stated that "fishers have the best knowledge about where, when and how vessels interact with seabird populations ... and some of the best knowledge about what methods are effective in reducing seabird bycatch (Hodgson 2003: no page).

traders, and urge CITES members to take action to protect toothfish species (HSI 2002a, b, c; 2003; 2004a).

Other ENGOs in the *NGO Sub-network* have focused upon changing consumer perceptions and encouraging hidden individuals to self-manage their behaviour by purchasing toothfish products caught only from sustainably managed fisheries. BOI is one such organisation. Based in New York, the United States, and founded in 2002, this organisation has members from the Audubon's Living Oceans Program and a co-founder, Mercedes Lee, is a MSC Board member. Its campaigners use science, art and literature to inspire a sea ethic and encourage the general public to form a closer relationship with the sea (BOI 2003), and to transform scientific and ENGO understandings into art and literature. For example, BOI has produced the widely recognised *Seafood Lover's Almanac* to highlight where fish come from, and how they are caught, managed and traded (BOI 2003).²⁶⁹ BOI has also developed a sophisticated Internet website, has taken an active role in trying to reduce seabird mortality incidental to fishing activities, and has established the *From Sea to Table Program* to evaluate wild and farmed fish and shellfish species, including the Patagonian toothfish, that are most commonly consumed as seafood in the United States (BOI 2004; 2005). MBA also focuses on changing consumer practices. Based in Monterey CA, the United States, and opened in 1984, the aquarium was a gift to the community by David and Lucile Packard (MBA 2005). Programs at MBA include the production of the *Seafood Watch: Choices for Healthy Oceans*, which is an interactive Internet guide, which includes the Patagonian toothfish, to show consumers how to make the right purchasing choices for healthy oceans. These ENGOs highlight that as management and traditional conservation strategies have failed to protect toothfish stocks, new groups of actor-networks have emerged that act at a distance to provide market incentives for improved management.

Artists, writers, journalists and members of the community are other social actor-networks that transfer power in the *Patagonian Toothfish Network* at a distance and/or indirectly when connecting with hidden actor-networks (see Fox 1999). For example, Andrew Darby was one of the first journalists to report on the toothfish and IUU fishing in 1997 (Darby 1997) and the international best selling author G. Bruce Knecht has released an epic novel recounting the events of the fishing vessel, *Viarsa I*, chase and its eventual apprehension (Knecht 2006; Respondent 12) (Section 5.3.3).²⁷⁰ Respondent 24 has also focused much of his work from 1998 on the Southern Ocean, Patagonian toothfish and the potential extinction of albatrosses resulting from incidental mortality on longline gear. He collaborated with Alistair Graham (TCT, WWF and ISOFISH) and

²⁶⁹ Carl Safina, another BOI co-founder has published *Song for the Blue Ocean* and *Beneath the Seas* and *Eye of the Albatross: Visions of Hope and Survival* (BOI 2003; Safina 1998; 2002).

²⁷⁰ A Hong Kong based foreign correspondent from the *Wall Street Journal* and author of the 2001 best selling novel recounting the events of the disastrous 1998 Sydney to Hobart yacht race (see Knecht 2001). His new novel is titled *Hooked: Pirates, poaching and the perfect fish* (see Knecht 2006).

Hobart ice-seller Jeff Williamson (whom ISOFISH sent to Port Louis with a mandate to report on the nature and extent of Mauritius' involvement in the IUU toothfish trade)²⁷¹ to raise community awareness about and global attention to albatross bycatch and, in turn, the Patagonian toothfish.²⁷² In this light, he mobilised the power of the media and Internet to communicate at a distance with the global community when he developed the ISOFISH and *Albatross Extinction Denied* Internet websites and created other relevant visual and audio media (Che 1998). For Respondent 24, it is crucial to present a sophisticated and professional image to attract attention when using these mediums. In addition, he created an art series employing bathymetric and water temperature maps to "transform science data into digitally produced pieces of art" and the *healing* colour blue because it is "bound to make a difference", which allows for understanding about the toothfish but does not confront the viewer antagonistically with overly political messages (Respondent 24) (Plate 6.1).

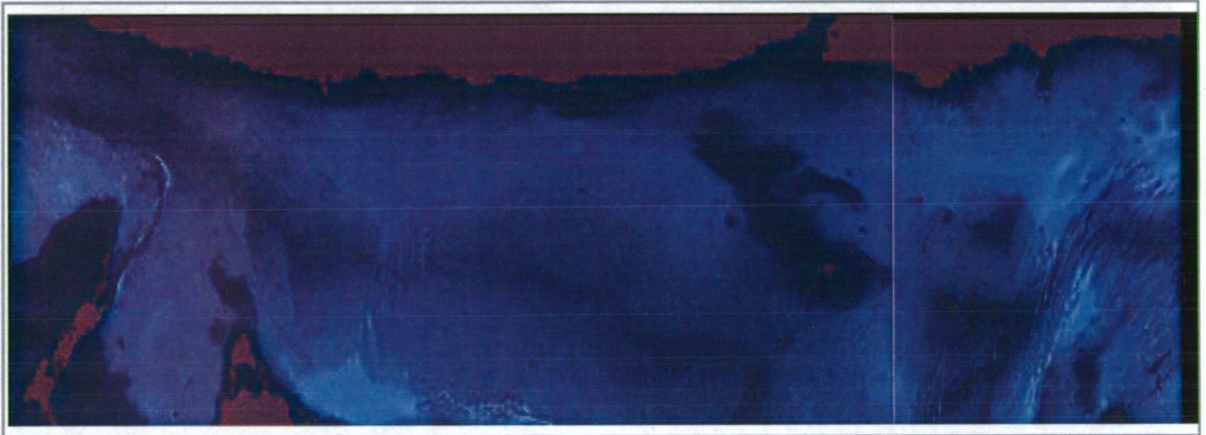


Plate 6.1: Lysonic watercolour titled *The Southern Ocean, extinction denied*, limited edition print (Source: Che 1998)

6.5 Observations

Through models of confirmation, negotiation and collaboration, the relationships between NGO pressure groups in the heterogeneous *NGO Sub-network* and wider *Patagonian Toothfish Network* and their relationships with other, often hidden actor-networks have undergone major changes, and through four distinct periods, since becoming involved in Antarctic affairs in the 1950s. Initially, SCAR was the sole NGO of significance in Antarctic affairs. ENGOs (such as ASOC, Greenpeace, WWF, Birdlife International and HSI) formed networks and coalitions, and pressured the debate to conserve and protect the Patagonian toothfish in the 1980s and 1990s. They engaged in confrontation with state actors and fishers to challenge or change debates; but also cooperated with, and cultivated sympathetic government officials; negotiated

²⁷¹ Respondent 24 recalls that Jeff Williamson's, and his own, relationship with ISOFISH *fractured* after disagreements about the release of sensitive information (see Fallon & Kriwoken 2004; ISOFISH 1998a).

²⁷² The *Albatross Extinction Denied* Internet website was developed to highlight the plight of albatrosses in English, Japanese and Spanish, and draws attention to the achievements of ISOFISH (Che 1998).

with ATCM and CCAMLR delegates to keep IUU fishing and other ecosystem threats on the negotiation table and educated the general public on threats to the toothfish fisheries. The lack of formal involvement in CCAMLR did not prevent these large and popular ENGOs from achieving their aims. By forming actor-networks to mobilise support and affect outcomes they rearticulated political agendas and spatial scales, and operated globally and independently from governments to gain popular legitimacy and use this strength to overcome recalcitrant ATCPs or CCAMLR member positions (see Latour 1997; 1998c; Law 1986; Kendell & Wickham 1998; Murdoch 1997b; 1998). Over time, they persuaded governments of the legitimacy of their non-state position before the wider public and in doing so, stabilised their own actor-networks. They also illustrate the capacity and power of pressure groups to communicate rapidly, negotiate political ideas and expose issues so that others, such as state actors and networks, are compelled to respond (see Kimball 1999; Litfin 1998; Rittberger 2000; Wapner 1998; 2000; Willetts 1982).

Over the past five years other ENGOs, including TRAFFIC, NET, BOI and MBA, have become increasingly influential, largely by conducting trade analysis and pressuring traders and consumers to purchase fish from sustainably managed fisheries. Other ENGOs (for example: SSS and ISOFISH when it was active) formed coalitions and alliances with traditional adversaries such as fishing industry operators. Adding to these developments, licensed fishers and the legitimately licensed toothfish industry came together to form their own INGOs (for example: MSC, COLTO, SARPC and ICFA) and measures to deal with the limitations of governmental power, and add value to government efforts to curb IUU fishing. The emerging cooperative relations that are increasingly connecting the legitimately licensed toothfish industry and ENGOs have been little studied, particularly with regard to the diverse sectoral interests and often competing objectives that emerge between the actor-networks. In addition, the construction of specific scientific, natural and social accounts to help explain the diversity between NGOs is problematic because such explanations are subjective, and dualisms need to be dissolved in order to explain their increasing influence in the *Patagonian Toothfish Network*. At the same time, professionalism and specialisation have contributed to the increasing influence of NGOs in Southern Ocean affairs (see Gordenker & Weiss 1995; Leipold 2000). With this in mind, governments have increasingly depended on NGOs for local consultation, professional assistance and industry information, and these organisations have sought to align themselves with governments to gain financial support in some cases and legitimacy in national and international fora. NGOs and the scientific community have also become increasingly inter-related and these groups actively seek to foster good relations, possibly because their objectives often align with one another. Notably, it is not necessarily the size of NGOs that determines their legitimacy or success, but the associations and connections they form. The ability to NGOs to transfer power and change relations in the *Patagonian Toothfish Network*, and their capacity to act in a dissident manner also

contributes to their influence. These strategies are important, given that governments have a limited capacity to act against IUU fishing because national laws constrain their action.

In the international toothfish arena, possibilities for NGOs to form alliances to exert influence above and beyond their often weaker formal status are enhanced because this somewhat disparate international management arena often provides the kind of informality and network-building capacity that works well for these groups. Referred to as the *environment/sovereignty nexus* (see Gordenker & Weiss 1996; Young 1989a, b), the informal management arena embodies and elucidates some of the core issues and challenges facing the toothfish fisheries; particularly when the actions of powerful multinational fishing corporations and the statelessness of some fishers who act beyond State controls significantly impact on the fisheries. Although state actor-networks have generated international regimes and mechanisms designed to overcome these forms of anarchy, different trans-national alliances among non-state actor-networks are increasingly influencing international efforts to manage, conserve and protect toothfish stocks. These NGOs may not be able to conserve the toothfish or stop IUU fishing alone because “States are still important power containers, political regulators and economic competitors” (Arts 2004: 508). However, they have raised awareness and created symbols of the toothfish problem by thinking and acting globally, as well as locally, to reframe national issues into global issues and *vice versa*. In this sense, NGOs are “localising and globalising along the way” (Murdoch 1997b: 334). They have also activated the general public, brought actor-networks together from around the world, been included in inter-governmental fora and on national delegations, raised and won arguments about defining what issues are worthy of consideration and developed new narratives for ecosystem management and sustainable toothfish fishing. Partly as a result of pressure applied by NGOs, CCAMLR members and various national governments have become more committed to finding solutions to eliminate IUU fishing. As concluded by Darby (1994: 171), the high level of transaction among most political actor-networks today, when coupled with the extensive resources and political sophistication of international NGOs, “ends any claim to the autonomy of isolation for state actors and is ignored by regimes at their own peril.” NGO interests in Southern Ocean affairs are here to stay and these groups will continue to work individually and/or cooperatively and combine a range of strategies to achieve their multiple objectives.

Chapter 7

Contested Performances

7.1 Introduction

This chapter explores how respondents conceptualise sustainability in the Patagonian and Antarctic toothfish fisheries. It also examines the effects of the contested meanings they apply to this term and others such as precaution, rational use and consensus decision-making, which are applied to management and conservation objectives. Issues of differing spatial scales are important where governing the environment (linked to space) comes into conflict with governing the rational use of toothfish stocks (linked to time). How sustainability is characterised by the heterogeneity of its interests that include biological, economic and social principles, and how various interest-driven actor-networks have engaged these ideological assumptions and accepted sustainability as an OPP though which they capture other actor-networks in the *Patagonian Toothfish Network*, are all unpacked.

Governing the Patagonian and Antarctic toothfish fisheries becomes problematised when the forms of knowledge that arise in the *Patagonian Toothfish Network* to inform these discourses are queried or disregarded by certain actor-networks. Although sustainability principles help to construct and stabilise the actor-network and elevate CCAMLR as an especially important head-actor able to mobilise power by squeezing the sustainability debate, the actor-network is also destabilised by the withholding or withdrawal of certain actors' allegiance to CCAMLR and the dissident actions of IUU operators. The contested performances of these actor-networks are explored and their actions highlight significant challenges related to how to deal with over-capacity, legal and legitimate access to the fisheries and continuous pressure on the resources. Their actions also show manifold challenges to science, contested stock assessments and management practices, and underscore the inability of CCAMLR members and States to take effective action against IUU operators. When this *conduct of conduct* is compromised, toothfish fisheries management is increasingly shown to be about choosing among limited alternatives on the basis of political pressure, economic imperatives, contested rules, conflicting preferences, incomplete science, anecdotal and/or other information and changing social norms.

7.2 Sustainability for the toothfish

7.2.1 Dimensions of sustainability

Intergenerational equity, precaution and sustainability can be confusing because there are no definitive or overarching definitions of them in the literature. For example,

sustainability is a dynamic value concept and about questions of balance maintained over time (see Dahl 1996; Mitchell 1998). It is made operational via sustainable development, meant “to meet the needs of the present without compromising the ability of future generations to meet their own needs” (Bruntland 1987: 8). It is advanced in Agenda 21, Chapter 17, which specifically considers sustainability in relation to the protection of the oceans and the rational use and development of their living resources (UN 1992).²⁷³ In this context, sustainability is scientific and ethical, requiring balance and justice for human and non-human actor-networks (interspecific equity), and present and future generations.

The urgent need to ensure sustainability for the Patagonian and Antarctic toothfish fisheries was unanimously supported by respondents that fall into the actor-network categories of scientists and researchers, and fishers and industry operators (Figures 5.6, 5.7 and 5.8; Appendix B). Sustainability for the toothfish fisheries was also important to approximately 80 per cent of respondents that fall into the actor-network categories of government officials and fishery managers, and NGO representatives and members of the community. Nonetheless, it is difficult to make any judgement on their understanding of sustainability or its application in a way that is individually meaningful, although they refer to the biological, economic and social discourses that comprise the term. Put simply, respondents define a traditional sustainable fishery as one where harvest rates equal or are lower than growth rates of a fish stock over time. For example, in the case of a remote biological species such as the Patagonian toothfish, Respondent 28 argues that “its population should be maintained at a level that ensures its function as a major predator in balancing prey species across its range, and that preserves an age structure in each population to ensure reproduction at, at least, replacement levels.” However, environmental fluctuations can alter an ecosystem and its fisheries regardless of whether it is impacted upon by human activities or not.

Then again, sustainability for the Patagonian and Antarctic toothfish can be viewed in scientific and managerial terms where more information on which to base decisions will always be needed in this uncertain world. For Respondent 61, “scientific information, stock assessment and the nature of the scientific advice to management [in the toothfish fisheries] is similar to many other fisheries” and it is a failure of national governments to ensure their sustainable management that is questionable. In this light, Respondent 39 articulates three principles for sustainable toothfish fisheries. They include the health and productivity of the target stock, the impact a fishery and fishing activities may have on the marine ecosystem (which can include non-target species as well as habitat), and the performance of the management system (including all elements of intervention from governmental and private sectors such as regulation, scientific research, court action, codes of conduct and good practice and/or community-based management and incentive

²⁷³ Vision can be imaged as a simply alternative way of using resources, or an ideological representation of a particular world view such as sustainable development (see Selman & Wragg 1999).

schemes). Toothfish fisheries can also be influenced by social externalities including ensuring equitable access to fishery resources and net socio-economic benefits for all [human] actor-networks such as small- and large-scale fishing operators, coastal States and other States, or indigenous and other communities over differing spatial scales (see Apostle *et al.* 1998; Brahm 2005; Respondents 31 and 37). Moreover, these views accord with that of Dovers and Handmer (1992: 265) who argue that sustainability is profoundly linked to natural and social systems that comprise actor-networks that mobilise and exert power upon other actor-networks, and that the supply of resources from an ecosystem cannot be considered without taking into account “the political, economic and institutional systems wherein that demand arises.” Ultimately, sustainability is a whole-network problem where dualisms need to be dissolved and agency restored in all things (see Latour 1986; 1992; 1993; 1997; 1999a; 2004; Murdoch 1997a, b). Moreover, sustainability is not a finite state, nor is it bounded in the *Patagonian Toothfish Network*, but a process of continuous improvement, and as knowledge of what constitutes sustainability increases, so too will the ability of actor-networks to manage the toothfish fisheries.

For Respondent 49, although sustainability has many dimensions, in the Convention on the Conservation of Antarctic Marine Living Resources “it is defined as optimising the *commercial* return from a fishery through time in a manner that does not compromise that fishery or that stock’s ability to regenerate itself though time.” The Convention on the Conservation of Antarctic Marine Living Resources refers to this principle as the *greatest net annual increment* (CCAMLR Convention 1980 Article II 3(a)) (Section 1.3.1). Nonetheless, Article II 3(c) of the Convention on the Conservation of Antarctic Marine Living Resources provides a starting place in terms of defining sustainability because it includes the precautionary principle and intergenerational equity, and states that non-sustainability are those elements that are not reversible over 20-30 years (see also Comisso & Manzoni 1998; Cordonnery 1998). However, political constraints that result from some CCAMLR members withdrawing their support for CCAMLR principles and measures can make it difficult for other CCAMLR members to maximise the objectives of Article II simultaneously, and scientists and fishery managers have needed to work to each government’s political requirements and definitions of sustainability. Therefore, sustainability also has a political element that comprises many competing dimensions whereby tension between ecological and harvesting status of the toothfish remains and how they are balanced in the *CCAMLR Sub-network* depends on the imperatives of governments that also act in national sub-networks.

Although many respondents have a broad understanding of sustainability, such forms of expression are implicitly concerned with instrumental values associated with the long-term maintenance of marine ecosystems for enjoyment, inspiration, and wealth (see Talbot 1996; Ward 2000). Even so, respondents understand the salience of intergenerational equity as a *value* principle by which each generation utilises and conserves

a stock of natural resources (in terms of natural and social values) in a manner which does not compromise their equitable use by future generations (see Scialabba 1998). They also recognise that it is implicit in ecological sustainability and fundamental to sustainability processes and outcomes. However, their understandings are also centred upon commercial imperatives and guaranteeing long-term economic sustainability that accepts the notion of limits and involves judgements about how marine resources might be used and how to secure access to the fisheries. This discussion underscores that point that ethical frameworks about the management of the toothfish are informed by many of the actors' positions on sustainability and, in many cases, there is an implicit linkage between the economic and ecological aspects of sustainability that accords with the rational use implication advocated by Article II of the Convention on the Conservation of Antarctic Marine Living Resources. Fundamental to sustainability is careful and consistent attention to environmental limits.

For example, some licensed fishers clearly understand the notion of constraint in this context such that "sustainability is necessary in all harvesting businesses where [fishers] are harvesting a target stock from ashore or the sea – sustainability is a must to keep nature in balance and protect the harvested species from vanishing" (Respondent 20). However, the idea of MSY that some licensed fishers embrace, centres on sustainability being more about economic considerations than ecology, population dynamics and conservation (Table 7.1). In this respect, Respondent 14 states that sustainability is "the optimum utilisation of resources (species specific) whilst ensuring that fishing has a minimal impact on the environment."

Table 7.1: Definitions of sustainability from respondents involved in the legitimately licensed toothfish industry

Respondent	Definitions of Sustainability
Respondent 1	Sustainability is ensuring a better quality of life now and for generations to come A sustainable toothfish fishery would be one where harvesting was based on a MSY which allowed the fishery to maintain its biomass
Respondent 3	[We] support CCAMLR in that it is both a harvesting and conservation regime where harvesting is managed by setting conservation measures in accordance with the sustainable exploitation of resources and precautionary principles
Respondent 4	Sustainability is a concept that we [licensed fishers] understand in the toothfish industry – IUU fishers have no intention of collaborating in sustainable matters A sustainable toothfish fishery is only possible if governments stop IUU FOC registrations ... and control their ports to stop IUU fishers from offloading their catch
Respondent 5	Sustainability is the ability of a resource to survive the amount of effort directed at it with no harmful effect on the future of the resource A sustainable toothfish fishery is the ability of the fishery to survive the amount of effort directed at it with no harmful effect on its future
Respondent 6	Sustainability is responsible use of a commercial resource such that the <i>take</i> does not drive the resource below a pre-determined level or unsustainably impact other species A sustainable toothfish fishery is where fish populations are conserved by promoting long-term sustainable utilisation of the target stock and general <i>health</i> of the ecosystem
Respondent 7	Sustainability is ensuring that a fishery is managed in such a way as to allow sufficient escapement of target species in order to maintain an exploitable level of activity

Respondent	Definitions of Sustainability
Respondent 8	A sustainable fishery provides for utilisation of the surplus production from a fish stock A sustainable toothfish fishery could be maintained if the stock were managed in accordance with CCAMLR principles and IUU fishing was stopped
Respondent 9	Sustainability is the ability of a stock to be maintained over the long-term to ensure continuation of the species A sustainable toothfish fishery in one the size of the Falkland Islands fishery – maintained by limiting the number of licences and conducting regular compliance activities
Respondent 10	Sustainability is using natural resources within their capacity to sustain ecological processes and maintain nature's life-support systems and intergenerational equity A sustainable toothfish fishery is where the target stock is maintained at high levels of abundance to maintain productivity, and precaution is used to maintain long-term yields
Respondent 11	Sustainability is necessary because any activity in contact with nature today must comply with "green rules" A sustainable toothfish fishery must be controlled by scientific surveys, and intelligent political decisions – happily licensed fishers are the key for a sustainable fishery
Respondent 12	Sustainability is where the target stock (and ecosystem) is managed using a precautionary approach, and the stock is maintained at, or above, replenishment levels A sustainable toothfish fishery is possible around South Georgia because substantive compliance activities are in place and stock assessments are well managed – if effective compliance is maintained and IUU fishing contained, the HIMI stock is sustainable
Respondent 14	Sustainability is the optimum utilisation of resources (species specific) whilst ensuring that fishing has a minimal impact on the environment A sustainable toothfish fishery could be achieved if compliance activities are effective and IUU fishing is stopped
Respondent 15	Sustainability is ensuring the environmental <i>health</i> of a resource A sustainable toothfish fishery is only possible if the resource is managed effectively to ensure the <i>health</i> of the stock and IUU fishing is stopped
Respondent 16	Sustainability is maintaining the original biomass and ecosystem integrity – the precautionary principle and intergenerational equity need to be applied A sustainable toothfish fishery (the HIMI fishery) is one where the original biomass is not fished down more than 50 per cent and precautionary principle is rigorously maintained
Respondent 17	Sustainability is where a precautionary approach is considered when managing target stocks to ensure that fish can be caught now, and forever into the future A sustainable toothfish fishery would ensure catches into the future – the HIMI fishery is sustainable providing that compliance activities are effective and IUU fishing is stopped
Respondent 20	Sustainability must keep nature in balance and protect the harvested species A sustainable toothfish fishery must carefully select quotas from as much scientific data as possible and apply precaution – however, data for the toothfish is not as good

Licensed fishers are also explicit about the economic and ecological ethical frameworks that inform their approach to fishing and managing the toothfish, and indicate that their companies have adopted, to varying degrees, a range of environment philosophies (Appendix E). Some such frameworks are reactive, acknowledging the motivational force of national regulatory regimes: "[Company K] considers that developing an environmental philosophy is the future of this company's activity ... [but our] philosophy is mainly imposed by the fishing regulations in force in each country" (Respondent 11). Others refer to the precautionary principle as a foundational element in robust ethical frameworks: "[Company T] sustainable management is needed in all fisheries and maybe more so for Patagonian toothfish" due to the lack of scientific data

(Respondent 20). Still others understand the purchase of “enlightened self-interest ... [and] ... support having a direct interest in the sustainability of key target species and the ecosystem that support them” (Respondent 10). In this instance, self-interest presupposes *possessive individualism* which re-centres nature and society around the individual and his or her property (see Callon 1997; Guesnerie 1996). It also extends to pride in leading the sustainable fishing debate. Nonetheless, measures to render calculable these notions of sustainability and environmental ethics remain illusive because they lack constancy and repeatability between the actor-networks.

In light of the diverse notions of sustainability and environmental ethics raised by legitimate fishers, Apostle *et al.* (1998) suggests that fisheries management (as any environmental management) is about managing human activity to avoid *undue harm* befalling natural systems subject to some criteria for determining what such harm may constitute. However, Holm (1999) contends that from an ANT perspective, it is a mistaken belief to assume that fisheries management is only about managing human activity because both fish and people implicate nature and society in the same network of action. Other difficult issues regarding sustainability are also worthy of debate, including the ethic of engagement related to questions of how to live and the ethics of ecological integrity, economic security, social well-being, and empowerment and responsibility (Fallon & Stratford 2003a; Institute for Sustainable Communities 2000). For the Patagonian toothfish, where these criteria reside and where the burden of proof as to their violation remains contested, especially when considering that it is not possible to determine whether the fish choose to be harvested or enter management and/or conservation debates. In addition, the burden of proof with regard to these criteria remains contested for many legitimate fishers. For example, Respondent 28 suggests that “the values based on free enterprise, individualism, and the ‘invisible hand’ of self-interest to the exclusion of effective governance or protection of the common interest is the major road-block to establishing principles of sustainability.” Nonetheless, he does acknowledge that promoting sustainability, effective governance and protection of the common interest requires fishers to change their moral values, cooperate with others, and comply with appropriate regulatory measures.

7.2.2 Scientific uncertainty and managing risk

In the pursuit of sustainable practices that account for environmental and social needs and norms, 60 per cent of respondents (particularly scientists and researchers) refer to the challenge of scientific uncertainty and note how the lack of available fisheries data (including abundance, recruitment and mortality data), and surveillance and trade data compromises stock assessments (Figures 5.6, 5.7 and 5.8). Respondents also comment on the uncertainty associated with IUU activities and how it influences political imperatives, scientific assessment and decision-making. As a result, they question whether the expansion of knowledge about the Patagonian or Antarctic toothfish has

successfully contributed to reducing pressures on these stocks given the high degree of scientific uncertainty in the toothfish fisheries.

In this light, effective management of the toothfish fisheries “relies upon sound and well managed data on population dynamics and the effects of fishing effort” (Haward 1998: 3). However, Yau *et al.* (2001: 403) also note that “little is known about the biology of *D. eleginoides*” and there are very few scientific studies that estimate the abundance of toothfish stocks that are independent of catch data from commercial fisheries. Other studies also indicate that the status of Patagonian toothfish populations is uncertain and most current techniques for assessing stocks rely on identifying isolated populations with neither immigration nor migration (see AAD 2001c; Appleyard *et al.* 2002; 2004; CQFE 2002b; Parker *et al.* 2002; Smith & McVeagh 2000; Williams *et al.* 2002). For example, although there appear to be population boundaries, particularly between the southern South America-Scotia Arc region and the islands of the Southern Indian Ocean, stocks harvested around South Georgia may transit neighbouring areas such as the Patagonian Slope and Argentine waters (Arkhipkin 2004; CCAMLR 2002a; FAO 1983; FIFD 1999; Respondent 2; TRAFFIC 2003b). Numbers of populations and stock units of Antarctic toothfish are also unknown and life history studies are yet to be completed, although this species appears to be characterised by low genetic diversity and restricted movement (Smith & Gaffney 2005). Therefore, it is useful to think of the toothfish acting in a dissident manner because they do not allow scientists to predict accurately their numbers or determine whether populations are isolated, migratory or resident, whether recruitment occurs between populations or whether they comprise a meta-population. Considering that “little information is available on the demography, genetics, or life history of this species” (Parker *et al.* 2002: 256), it is easier to describe the nature of scientific uncertainty rather than quantifying its effects.

More specifically, Respondents 11, 15, 20 and 54 consider that estimating the extent of toothfish stocks is difficult because scientific understandings are contested between various actor-networks. For example, they refer to the difficulties of determining sustainable TAC levels that are based upon incomplete data sets or assessment models developed from limited SSRUs in waters around the South Georgia and HIMI fisheries. For them, the findings may not account for IUU fishing activities or patterns of straddling, transition, or migration within these populations or in other waters (Section 3.5.3). In addition, respondents state that TAC levels based on an assumption that future IUU fishing efforts will be zero is problematic because these activities remove an unknown number of fish from the fisheries (Section 5.2.2). Adding to these complexities are problems associated with applying decision rules that are modelled on krill using the KYM and generalised to the toothfish using the GYM, which may not be species/issue specific or precautionary enough to ensure their sustainability (see

Constable & de la Mare 1996; Constable *et al.* 2000).²⁷⁴ With respect to these contested issues, scientific members of the SouthMAC consider that although the GYM was appropriate in the past, other standardised methods and management tools ought to be developed to incorporate time series research data (Australia 2005b).

Nonetheless, Respondent 66 outlines the steps necessary to ensure sustainability of the toothfish fisheries. For him, scientists hold the answers because science prevails over other forms of governing and knowledge. In his words, scientists need to conduct monitoring and stock assessments to evaluate the status of the stocks; after which they need to develop and use appropriate models to project future stock levels under different harvesting rates. Once monitoring and assessment of the fisheries verify that harvesting levels are sustainable (with regard to being above some agreed biomass level with associated decision rules) then the target stock could be deemed as sustainable. However, Respondent 66 warns that scientific uncertainty remains and continued research and monitoring are required to maintain confidence in the management procedures. In addition, it is important to consider the sustainability of other species affected by harvesting toothfish stocks and the impacts that broader ecosystem fluctuations might have on these stocks because no fishery is sustainable if it unduly impacts upon another species or its ecosystem.

As such, respondents highlight that contested connections among sustainability, risk and scientific uncertainty characterise the Patagonian toothfish fisheries. They also refer to social and political imperatives that unduly influence scientific understandings and the ability of scientists to determine how best to utilise rationally the natural fish resource.²⁷⁵ In this regard, some question whether the British Government is applying precautionary fisheries management given its past actions to keep the South Georgia toothfish fishery open based on the premise that it “is a discrete stock with little or no trans-boundary movement [that] can be managed sustainably (Respondent 44). However, Respondent 2 views any problems associated with managing the South Georgia fishery as “an assessment problem.” For him, this is a common problem when scientists are learning more about a particular species and using adaptive management.²⁷⁶ He explains that when establishing fishery and decision rules, scientists and fishery managers start by assessing risks and making a very conservative guess, after which, “they implement an assessment method that they think might work” scientifically and politically (Respondent 2). As more is learnt about the species, a more

²⁷⁴ The way CCAMLR members take into account IUU fishing catch in the decision rules (taken over 35 years rather than factoring last year’s impacts into the following year’s TAC) may not be precautionary enough to ensure the sustainability of the toothfish (Respondent 69).

²⁷⁵ Holm (2001), also details a similar tension between political institutional forms and scientifically rational forms of intervention connected to Norwegian fisheries resource management during the 1980s and 1990s. He describes the tension as the collide between social issues of value, equity and justice and other issues securely tied to nature and centred on impartiality, neutrality and common interest.

²⁷⁶ According to Folke *et al.* (2005: 441) adaptive management systems “often self-organise as social networks with teams and actor groups that draw on various knowledge systems and experiences for the development of a common understanding and policies.”

effective assessment method is developed, or a new assessment method is adopted if the first is inadequate.

The effect of this discourse is an increasing investment by the actor-networks in scientific endeavours and the assumption that more data and scientific understandings will provide greater certainty on which to base fishery management decisions. It also transforms scientists as a powerful actor-network that are capable of monopolising knowledge about the Patagonian toothfish by establishing an OPP that other actor-networks accept (see Holm 2001). Here, scientists hold the answers and science is triumphant over nature and society. However, scientists and the measurement procedures, data collection and abstract models they mobilise to reconstruct the toothfish from a wild animal to a scaled and modelled resource that can be managed by humans have failed to black box the toothfish (see Holm 1999; 2002). In short, scientists are unable to speak for the toothfish because the fish fail to act as a simple, self-contained and self-stabilising fishery; and continue to powerfully take their own path. In addition, scientists and the scientific understandings they generate are not value free or apolitical, nor are the ideas generated universally held or mobilised by other actor-networks in the *Patagonian Toothfish Network* and other understandings, including those put forward by fishers, NGOs and other actor-networks are becoming increasingly powerful representations.

Therefore, calculating risk, scientific uncertainty and political influence and incorporating other understandings are unstable processes that lengthen the *Patagonian Toothfish Network*. Although scientific understanding, knowledge and technical power have increased, uncertainty has also increased because the scale of the intended and unpredictable pressures on the fisheries is greater. A strong thrust of Patagonian toothfish management has been to reduce scientific uncertainty and maximise control over the natural environment. Yet uncertainty will always exist and ecosystems will remain unstable and adaptive, whatever data gathering and scientific analysis are undertaken. Additional knowledge may not in itself provide all the answers (see Dovers & Holden 1992; NMFS 1998). Given that ecological uncertainties are inherent, Miller *et al.* (2004: 320) contend that “the Convention’s provisions have necessitated innovative thinking to develop a holistic, scientific and ecologically based management approach.” Therefore, toothfish managers have needed to deal with risk across different spatial scales, govern risk beyond the boundary of any one State and strive to ensure that toothfish stocks and the ecosystem are resilient to change and persist (see Charles 2004).²⁷⁷ However, this discussion also highlights that human actor-networks have needed to remain flexible enough to cope with unpredictable uncertainty and respond positively and quickly to problems such as over-fishing and IUU fishing. This is because decision-making includes both natural and social factors that are interrelated in

²⁷⁷ Resilience refers to the capability of ecosystems to absorb unexpected shocks and disturbances (resulting from natural or human actions) and *bounce back* and persist without collapsing or entering an intrinsically undesirable state (Charles 2004).

complex actor-networks, and occurs in spite of incomplete knowledge. In this sense, sustainability includes the ability of human and non-human actor-networks to withstand or adapt to constant change indefinitely.

Precaution is central to managing such a challenge, and is an inherent element of risk analysis (Commission of the European Communities 2000; Cox 2003; García 1994; Mitchell 1998). It is also problematised, particularly when some States in the *Patagonian Toothfish Network* define precautionary in an uncompromising conservation sense, but others take a strong development approach that is essentially anti-precautionary (Respondent 61). However, the most widely recognised international definition of the precautionary approach to decision-making is set out in Agenda 21, Principle 15, where:

In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation (UN 1992).

Here, Agenda 21 is an important demonstration of the acceptance of the precautionary approach by the international community as a social norm, and of how the debate is squeezed through an OPP for actor-network members (see Selman & Wragg 1999). For example, the Convention on the Conservation of Antarctic Marine Living Resources confirms this OPP and recognises the need to prevent changes or minimise the risk of changes in the marine ecosystem which are not reversible over 20-30 years (CAMLR Convention 1980 Article II 3(c)). National governments also accept this OPP and have included the precautionary approach in environment-related legislation in a manner that closely relates to Agenda 21.²⁷⁸

Some respondents also consider that managing risk includes finding a precautionary balance between the fishing effort and capacity for recovery of the fish stocks. For example, licensed fishers echo many of these sentiments and many refer to precaution as the need to consider the whole and not simply the parts: “precaution is used to maintain yields over the long-term in a way that conserves the stocks role and function in the ecosystem” (Respondent 10). For others it includes intergenerational equity: “to ensure that fish can be caught now, and forever into the future” (Respondent 17). The UN Fish Stocks Agreement also seeks to balance fishing effort and conservation, but it refers to restoring “[fish]stocks at levels capable of producing maximum sustainable yield” (Part II Article 5 (b)). In this vein, the UN Fish Stocks Agreement has accepted the OPP established by Agenda 21, and it details the application of the precautionary principle as broadly being where States:

²⁷⁸ For example, the Australian EPBC Act states that “lack of full scientific certainty should not be used as a reason for postponing a measure to prevent degradation of the environment where there are threats of serious or irreversible environmental damage” (Australia 1999a Chapter 6 Part 16).

... apply the precautionary approach widely to conservation, management and exploitation of straddling fish stocks and highly migratory fish stocks in order to protect the living marine resources and preserve the marine environment ... and ... be more cautious when information is uncertain, unreliable, or inadequate ... and ... the absence of adequate scientific information shall not be used as a reason for postponing or failing to take conservation and management measures (UN 2001 Part II Article 6).

Given the broad application of the precautionary principle in the UN Fish Stocks Agreement, it remains unclear whether some respondents fully understand the implications of applying this *value* principle to toothfish management or how much of their sentiments are *window-dressing* aimed at self-promotion. For example, Respondent 16 explains that “we have a strong self-interest in ensuring that the fishery that we have an invested in has a real chance of being a sound and solid investment ... ensuring a sustainable fishery is essentially about asset management.”

Despite these ambiguities, many respondents regard precautionary decision-making as fundamental to managing toothfish stocks because inherently high levels of uncertainty and ignorance will remain in the available knowledge although future decisions may be refined as more information becomes available.²⁷⁹ For Respondent 26, scientists and managers “do take into account a sufficiently precautionary approach and consider issues of uncertainty when estimating toothfish catch limits.” However, rendering calculable the success of applying precautionary fisheries management remains a contested and unresolved issue. In addition, its application implies that decisions ought not be made until sufficient information about the consequences of any action becomes available. This stance also assumes that [we] are capable of becoming masters of certain knowledge in an uncertain world (see Serres 1995). Therefore, despite CCAMLR members having built decision rules into their assessments in an effort to maintain toothfish stocks at adequate levels and allow predators of the target stock to be maintained, some toothfish fisheries have been severely impacted upon by IUU fishing: an activity that accelerates uncertainty and severely compromises the sustainability of these species.

Moreover, IUU fishing destabilises the *Patagonian Toothfish Network* by undermining the efforts of CCAMLR members and national governments to apply the precautionary approach to toothfish management. Like sustainability, the precautionary approach is characterised by the heterogeneity of its ambit of interests. Consequently, it is difficult to define what constitutes adequate precaution and the application of the precautionary approach internationally can be contentious and highly politicised, and involves an element of risk. Some respondents suggest that the precautionary approach should not be confused with the caution that scientists need to apply in their assessment of

²⁷⁹ For Garcia (1994), uncertainty is a result of the natural variability of fisheries and their environment, limited data, the limitations of current scientific models, limited research funding, difficulty in conducting research on the high seas and the fluctuation of economic parameters related to fisheries.

scientific data. For them, implementation of a precautionary approach to toothfish management should start with a comprehensive scientific evaluation that identifies the degree of scientific uncertainty. Decision-makers then need to make political decisions based on their judgement on what is an *acceptable* level of risk for the toothfish taking into consideration scientific uncertainty, social imperatives and the intrinsic value of the fish themselves. Therefore, nature, society and the precautionary principle “reside in the permanent maintenance of the impossibility of folding” and there will always be permanent and continuous conflict that forbids any mastery (Latour 2002: 258).

This discussion leads on to issues centred on the intrinsic values of the Patagonian toothfish and Southern Ocean ecosystem, irrespective of their social, environmental, or economic significance to people (see Fallon & Stratford 2003a; Mitchell 1998; Ward 2000). Intrinsic values are largely hidden in the *Patagonian Toothfish Network* and only six per cent of respondents reflect upon these qualities (with officials, government managers and fishing industry respondents failing to comment).²⁸⁰ In addition, only three per cent of respondents consider the uncertain consequences of climatic and oceanographic changes and the impact they might have on the toothfish fisheries or measures that might be implemented to conserve the environment or fish stocks (with officials, government managers and NGO respondents failing to comment) (see AAD 2005d; Croxall & Nicol 2004; Miller & Munro 2004; *The Mercury* 2005). In this respect, Respondent 53 calls for additional research to assess urgently these implications. In addition, ENGO respondents highlight the way other actor-networks view human relations with the toothfish and alter the socio-historical context within which they interact with the actor-network and the environment. They take an anthropocentric view, but stress the need for managers to consider the intrinsic values of this species and the ecosystem prior to advocating rational use and setting TAC levels (Respondents 24, 36, 41 and 69). For example, “Antarctica is the common heritage of man [sic] and the domain of everybody ... For certain countries to set the rules for an area that is owned by us all is ... arrogant” (Respondent 25). Respondent 36 also asks:

What about tomorrow, what about the broader issues of having one part of the world where the environment and ecosystem are not [negatively] impacted by man’s activities, that is still clean and aesthetic, that has the ability to replenish the atmosphere, the oceans and the land? What about this place as being a scientific laboratory where we can learn about how our world functions, and a place that we can leave for tomorrow?

In this discussion science is triumphant. Respondents appeal not only to moral discourse, but also engage scientific discourse to provide more certainty about the intrinsic values of the toothfish, how the Southern Ocean ecosystem functions, and how

²⁸⁰ Mitchell (1998: 163) draws on Naess (1972) and states that deep ecology is committed to “limiting human exploitation of nature’s intrinsic values”, and shallow ecology is committed to “limiting human activities when science demonstrates that those activities threaten nature’s instrumental value to humans.” Here, shallow ecology advocates managing the toothfish contingent on scientific consensus, whereas deep ecology dictates protection of the toothfish regardless of scientific evidence.

they ought be managed and governed. Science has become a normal way or practise where certain actor-networks have taken on a conventional thought, which other actor-networks are then urged to accept if they are to engender support and associate with actor-networks in the *Patagonian Toothfish Network* (see Mitchell 1998; Selman & Wragg 1999; Sikkink 1993).

7.2.3 Economic sustainability

Respondent 49 extends the debate and argues that it is within the confines of economic sustainability that “problems regarding sustainability for the toothfish arise.” Respondent 48 also states, “the market value of the fish is well above the costs incurred to catch and sell it ... Investing in the fishery is very convenient ... [and] ... given the prevailing conditions in the fishing industry, economic equilibrium will be achieved at very low population levels.” Respondents explain that economic sustainability in the toothfish fisheries is about fishers managing capital and risk to optimise profits. In addition, Respondents 12, 18, 67 and 68 suggest that the harvesting will continue as long as there are fish to be caught and the sustainability of the toothfish fisheries is inextricably linked to greed. Forty-eight per cent of respondents also note the imperative to consider *economic drivers* that fuel IUU fishing (Figure 5.6).²⁸¹ As such, calculating human actor-networks embody *possessive individualism*, and they pursue their own divergent interests and engage in decentralised decision-making where conflicts are resolved in transactions that establish an equivalence measured by prices (see Callon 1997; Guesnerie 1996).

Notably, *economic drivers* underpin the actions of IUU fishers because IUU fishing is a manifestation of their preparedness to risk assets for high returns in an environment where their costs are lower than those of fishers operating legitimately (see Agnew & Barnes 2004; Hatcher 2004; Sumaila 2004). Incentives to invest in IUU activities include lower operating costs (such as lower running, crew, maintenance, administration and flagging costs; and often no registration and insurance costs) (Australia 2005b; OECD 2004b).²⁸² Other incentives include lower capital costs (such as purchasing older and/or cheaper vessels, and less safety equipment and other navigation, communications and VMS equipment); and the lower cost of engaging in IUU activities (such as the gains made from engaging in fraud and corruption, failing to comply with practises of the *International MCS Network*, apprehension avoidance, and not needing to maintain industry reputation). According to Agnew (2005: 15), IUU operators can remain profitable by catching relatively small hauls, and net economic gains from IUU fishing within areas of national control “are possible with a catch rate of four or five tonnes per day and on the high seas, catch rates can be as low as one tonne per day.”

²⁸¹ Sixty-seven per cent of scientists consider *economic drivers* as important compared to 63 per cent of NGO representatives, 44 per cent of fishers, and 28 per cent of officials and fishery managers.

²⁸² Twenty-five per cent of Australian toothfish industry costs are allocated to fuel (Australia 2005b).

The activities of IUU fishers are similar to mining operations where a resource is exploited and never replaced (see Butterworth & Penney 2004; Mansfield 2004). IUU fishers live off the interest of the fisheries by capitalising on the resource's sustainable potential by overexploiting the *biological capital* (or recruitment stock). When stock numbers collapse, fishers risk their investment and profit, their activities become too risky and they withdraw to other more profitable ventures. The longer fishers conduct fishing activities, the greater the risks and possibility that profits and capital will be compromised. Respondent 49 considers that this situation of "first in–first out" of the toothfish fisheries fundamentally compromises biological sustainability. However, although fishers leave a fishery when it becomes unviable, IUU fishing or over-fishing create added disadvantages for the toothfish because as the stocks become rarer they become more valuable and the fishers' income and desire to fish is sustained (Respondent 26).

In addition, developed States have the resources to perpetuate problems of over-fishing because First World fishing subsidies generate excess fishing capacity and, until infrastructure is taken out of the fishing industry, this problem is likely to continue (Respondent 49). In response to this global crisis, the FAO adopted the *International Plan of Action for the Management of Fishing Capacity* (IPOA-Capacity) in 1998 and calls on States to take measures to prevent or eliminate excess fishing capacity and ensure that fishing effort is commensurate with sustainable use of fishery resources (FAO 1998b). Despite this initiative, Respondent 53 considers that over-capacity in the fisheries is an ongoing and complex issue associated with social imperatives and economic survival. For example, when fishing for North Atlantic cod became unsustainable at the end of the 1980s, a disjuncture was created in the *North Atlantic Cod Network* and the extensive Spanish fleet moved from its traditional fishing grounds in Canada, Iceland and Norway and was forced to look for new fisheries in international waters to remain economically viable. By 1985, many fishing companies, including those from Spain and others from Norway and Russia, became disaffected in the Northern Hemisphere, realigned themselves in the *Global Fish Network* and relocated to South American and South African waters to fish for hake and ling species because they are similar to the North Atlantic cod.

Respondent 53 explains that due to loose and more flexible political conditions in the Southern Hemisphere, fishers displaced from the Northern Hemisphere fisheries were able to establish joint ventures (and associate) with other fishers in Southern regions and continue fishing until the resources became over-exploited. For example, 70 longline fishing vessels harvested hake species from 1986 until 1990 in Chile. When the hake fisheries became seriously depleted, the Chilean Government approved the *General Law of Fisheries and Aquaculture, 1991* to stop free access to Chilean fishery resources (Sections 4.2.1 and 4.4.1). Many fishers exploited Patagonian toothfish stocks in Chile under the new fishery law. After the first commercial fishing seasons in the early-1990s,

Chilean fishing authorities determined that the fishery could only sustainably support 20 longline fishing vessels; a situation that left the remaining 50 vessels without access to the fishery. In an attempt to support their livelihoods, some of these disaffected fishers began fishing around South Georgia in 1998 to maintain their operations. Many also acted in a dissident manner and relocated their companies from Chile to other States “without fishing traditions or without legislation for reflagging ... and this began the IUU fisheries around the Antarctic continent” (Respondent 53). Although over-fishing and over-capacity in the Northern Hemisphere fisheries did not result in fishers moving directly into the toothfish fisheries, they did exploit other fisheries in the Southern Ocean to unsustainable levels before targeting toothfish stocks. For Respondent 58, some of these operators also sought “to find an activity to justify the vessels they maintain to operate their other illegal activities” because fishers can have legitimate fishing activities that they use as a front to mask other illegal activities and “this situation is seen in the toothfish fisheries” (see also ABC 2005b).

Moreover, 48 per cent of respondents consider that unless governments take into account the *economic drivers* that fuel the toothfish industry (such as taking infrastructure out of the industry) and their connections to biological and social sustainability, the long-term survival of the toothfish will continue to be compromised (Figure 5.6). Charles (2004: no page) also argues that if fisheries managers fail to deal adequately with displaced fishers, then policies dealing with over-fishing and over-capacity to reduce the number of fishers “may well aggravate the fishery problem” because they will continue to target the stocks to support their livelihoods regardless of State-led measures put in place to manage the fishery. Therefore, the concerns of fishers are important because their interests are part of the whole-network problem and if disregarded, they are more likely to contest and/or resist governance arrangements. This discussion highlights that the proliferation of international measures, and government policies, laws and regulations is unlikely to be effective if fishers are unable or unwilling to comply with them. For Charles (2004), livelihood diversification is the key to managing the fisheries sustainably where new, sustainable economic activities outside the fishery sector are available for displaced fishers.

Despite these tensions, Respondent 2 considers that economically viable solutions can be factored into sustainable management measures for the toothfish fisheries. This is partly because the toothfish is valuable. Although a relatively small catch can make a voyage economically viable, fishers are more likely to comply with regulations if the benefit of complying is perceived as being more profitable than not complying. However, Respondent 2 also warns that economic viability can be affected by the management system itself. Therefore, the fisheries and fishing rights allocated to legitimate fishers need to be adequately protected by governments if fishing authorities are successfully to entice fishers to operate within the law. Respondent 54 also states that fishery managers need to design available TAC regimes to ensure that fishers are

able to operate in an environmentally sensitive and economically lawful manner. For him, if fishers are able to trade TAC quotas between operators, it is not necessary to provide each fisher with a TAC quota that will provide sufficient revenue to support their operations. Once toothfish resources are allocated, fishers can buy or lease a quota to each other to ensure economic viability.

7.2.4 Social sustainability

The toothfish fisheries are part of socio-political and cultural actor-networks, such as those of Spain and Norway (two traditional toothfish fishing States) where historical fishing culture stretches back centuries (Appendix C). This is also the case in Argentina and Chile (States where Patagonian toothfish fisheries are located in national maritime waters). There, coastal communities and cultures have been built on fishing. toothfish fishing also provides a valuable source of income to other island fishing communities located in the Southern Ocean and trade in toothfish products, both legitimate and illegal, generates income for trading States such as Chile, Mauritius and Namibia. Importantly, fishery resources provide more than an income for these States; they contribute to the culture of these societies. For example, fishing for Patagonian toothfish provides an important source of income to fishers and a revenue base for the Falkland Islands Government (Respondent 2),²⁸³ and fish licences provide over 90 per cent of the total revenue received by the Government of SGSSI (Respondent 40). Issues of sustainability are also relevant to the residents of La Réunion Island.²⁸⁴ For Respondent 58, La Réunion Island is deeply linked to France and heavily reliant on assistance from the French Government to maintain the inhabitants' standard of living. Unemployment is high and, consequently, the toothfish fisheries quickly became an important industry sector of the island's economy after the fishery commenced in 1996. Today it is the third most important industry sector after sugar cane production and tourism.

In this context, and in the pursuit of sustainable practices that account for environmental and social needs and norms, 30 per cent of respondents note issues of social equity. For them, the trade of IUU toothfish products in the global marketplace compromise not only economic sustainability of States, but also the social sustainability of the legitimate fishers' businesses and fishing communities (fishers and industry operators failed to comment) (Figure 5.6). Respondents also identify *social drivers* that can fuel IUU fishing activities (see also Agnew & Barnes 2004; Bassett 2004; Whitlow 2004). For example, some States may overexploit their own fishing grounds and seek new grounds in other national maritime waters or on the high seas in an effort to assure employment or food security. Crew members from developing States may also seek employment with IUU fishing operators through economic necessity because their own fisheries

²⁸³ The Falkland Islands comprise two main islands, 200 smaller islands and less than 2,500 inhabitants. Approximately 50 per cent of fishers income comes from squid fishing, and toothfish generates a very small component of the fishing economy (Falkland Islands Government 2004; 2005 a, b; Respondent 40).

²⁸⁴ La Réunion Island is a small island approximately 80 km in length with 720,000 inhabitants.

have become unsustainable. In turn, IUU operators may actively seek crews from developing States because they do not need to comply with health and safety regulations or adhere to acceptable working conditions and workers' rights in accordance with the 1974 International Convention for the Safety of Life at Sea or IMO standards (IMO 2002; SOLAS 74) (Section 5.2.1). Notably, only five per cent of respondents commented on the hidden issue of needing to protect vulnerable and neglected crew (scientists, researchers, fishers and industry operators failed to comment).

With these issues in mind, Respondents 31 and 37 contend that simultaneous objectives of economic growth, environmental and resource sustainability and social equity are important to managing toothfish stocks sustainably. For them, it is important that harvest rates maximise economic growth in terms of employment and income subject to biological sustainability, cultural norms and social equity constraints. However, Respondent 41 points out that although the critical debates for the toothfish fisheries are predominantly concerned with marine conservation, resource allocation and stopping IUU activities; if the toothfish fisheries are to be sustainable, social sustainability is important because the governing institutions and laws that rule fishers and fishing operators need to be respected by all relevant social actor-networks. Ultimately, adequate governance depends on the legitimacy of the political system and the resulting respect shown for its institutions, and the efficacy or reliability of governing institutions (see Borrini-Feyerabend 1997). However, this discussion once again highlights that the proliferation of international standards and government policies, laws and regulations to manage the fisheries or protect vulnerable fishers are unlikely to be effective if fishers are unable or unwilling to comply with them. It also illustrates that the *Patagonian Toothfish Network* has shifted and extended as the actors have considered the importance of the toothfish to human actor-networks and how it can influence social imperatives.

7.2.5 Biological sustainability

Many respondents indicate that without biological sustainability, all other forms of sustainability are irrelevant. Some strongly oppose broadening the scope of sustainability and the precautionary approach to include economic, social and cultural dimensions because it might undermine scientific decision-making, increase scientific uncertainty and result in the management of toothfish stocks becoming more politicised. For example, "biological sustainability is in everyone's interest and without it other aspects of sustainability ... cannot be assured" (Respondent 34). In particular, some respondents consider that if effectively managed, toothfish stocks around the Falkland Islands, South Georgia and HIMI are sustainable, although others question whether CCAMLR members have adequate scientific knowledge to conclude that any toothfish fisheries are sustainable or whether there are linkages between the toothfish and other marine species or the ecosystem.

In particular, very little is known about the biological sustainability of Chilean and Argentinean Patagonian toothfish stocks (TRAFFIC 2003b). For Respondent 65, “it appears that the [Chilean] artisanal fishery ... is doing better than the commercial fishery”, although there is no scientifically-based management plan for the artisanal fishery and the TAC is based on historical catch. However, Juan Carlos Cárdenas *et al.* (2005: no page) reports that the artisanal and commercial fisheries are “over-fished” and in a “critical state”, and the TAC set for the artisanal fishery in particular was set at zero in 2004.²⁸⁵ In addition, in the late-1990s, a significant decline in Patagonian toothfish stocks caused the Argentine Government to set TAC quotas at approximately 8,000 metric tonnes/year to 10,000 metric tonnes/year (Respondent 2), and in 2004, the TAC was further reduced to 2,250 metric tonnes and a fishing ban from 29 September to 31 December was implemented to allow the stocks to recover (*Mercosur* 2004). Concerns have also been raised in relation to the number of juveniles being harvested and, in 2004, the Argentine National Institute for Fisheries Research and Development claimed that juveniles made up 80 per cent of the catch (*Mercosur* 2004).

Respondents 44 and 65 question whether the Patagonian toothfish fishery around South Georgia is sustainable because errors in the stock assessment methodology for this fishery may have resulted in over-fishing. In addition, at the twenty-third CCAMLR meeting in 2004, the SC-CCAMLR provided guidance with respect to the application of the GYM for the South Georgia fishery and noted that there is “considerable uncertainty in the current status of the stock in Sub-area 48.3” and that an estimate of zero ought to be set for the 2004/05 fishing season given that problems in the scientific model used to assess the fishery need to be resolved and a new more robust model developed (CCAMLR 2004c §5.155-§5.165). Additional problems are also associated with CCAMLR members extrapolating the results of this stock assessment methodology to other Indian Ocean fisheries (Respondent 25). However, Respondent 2 counters these critics and states that if IUU fishing is stopped, this fishery is “certainly sustainable in the long-term.” Other scientific, government, IGO and NGO actor-networks generally agree, and consider that this large fishery could be managed sustainably providing that TACs are set correctly and IUU fishing is controlled (Respondents 49, 52, 57, 61 and 69).

Patagonian toothfish stocks found in waters around the PEMI have crashed due to IUU fishing (Section 4.4.5). Respondent 18 acknowledges that the South Africa Government “is now forced to consider stock re-building measures for toothfish in these waters” to protect the stocks. However, in 2005 the South African Government asserted national interests, claimed that “poaching” around the PEMI “has been brought under control ... and the fishery remains commercially sustainable provided that it is effectively regulated”, and announced its intention to allocate long-term commercial fishing rights

²⁸⁵ Juan Carlos Cárdenas *et al.* (2005: no page) also report that Spanish operators such as Concar, Suribérica and Pesca Cisnes have accessed the Chilean toothfish fisheries, but are also suspected of IUU toothfish fishing activities.

in the fishery (South Africa 2005: 5). Nonetheless, Respondent 49 states there are “no opportunities for harvesting toothfish” from PEMI waters and the fishery, like those found around the French maritime waters of Kerguelén and Crozet Islands, is “emphatically unsustainable.” In addition, the SC-CCAMLR was unable to provide management advice for the fishery in 2005 because the assessment was not based on CCAMLR decision rules (CCAMLR XXIV 2005g §4.40).

The sustainability of the Kerguelén and Crozet Islands Patagonian toothfish fisheries is highly contested. Although Respondent 58 maintains they are sustainable providing that IUU fishing is stopped, many other respondents deem the fisheries as unsustainable. In addition, the Crozet Islands fishery may also be more fragile than the Kerguelén Island fishery because it is a small fishery and over-fishing is likely to affect significantly recruitment into the fishery (Respondent 26). The SC-CCAMLR also estimates that over 4,600 seabirds were caught on longlines in these fisheries in the 2004/05 fishing season (CCAMLR 2005d, f).²⁸⁶ In this regard, Delord *et al.* (2005) suggest that bycatch mortality will only be reduced if a *reasonable trade-off* is found between the fisheries and seabird conservation. They recommend that fishing effort around the Kerguelén Islands be reduced by 30 per cent to reduce seabird bycatch and transferred to the [potentially less resilient] Crozet Islands fishery. Notably, Australian SouthMAC members are concerned about the lack of scientific data on which to assess these *shared* toothfish fisheries considering that the Kerguelén Islands stock is possibly a straddling or trans-boundary population that extends across the Kerguelén Plateau from Williams Ridge (partly outside the Convention Area on the Kerguelén Plateau edge) across the HIMI to the Kerguelén Islands and then Crozet Islands (Australia 2005b; William *et al.* 2002). Tagged fish from these waters have been sighted as far as PEMI.

For Respondent 49, the HIMI Patagonian toothfish fishery is comparable to the South Georgia fishery and “can probably be fished sustainably providing that IUU fishing is curtailed” (see Kock *et al.* in press). In addition, Australian fishery managers and scientists consider there are *opportunities* for harvesting in this fishery providing that IUU fishing is stopped, and given that management is based on good science (Respondents 26, 54, 57, 59 and 61). Some NGO respondents also concede that the HIMI fishery *may* be sustainable (Respondents 44, 52 and 65). Then again, Respondent 69 argues that the “long-term sustainability of the [HIMI] stock is questionable in terms of both its biological and economic sustainability” given scientific uncertainty about the stocks. Her comments are to some extent supported by the SC-CCAMLR that noted problems in the HIMI fishery assessment model in 2005 and stated that the yield projections need to be evaluated to ensure they are “robust to uncertainties” (CCAMLR 2005d §4.75).²⁸⁷ In addition, Respondent 26 reaffirms that scientists know little about

²⁸⁶ The SC-CCAMLR noted that in the 2004/05 fishing season an estimate of seabird mortality for CCAMLR Sub-areas 58.6 and 58.5.1 was 242 and 4387 seabirds respectively (CCAMLR 2005f §7.9).

²⁸⁷ The stock assessment model for the HIMI Patagonian toothfish fishery is based on the stock assessment conducted for the South Georgia Patagonian toothfish fishery.

the dynamics of this trans-boundary toothfish stock or whether it comprises a single meta-population that might be affected by fishing activities in other fishing grounds.²⁸⁸

Problems have also arisen regarding to the biological sustainability of the Macquarie Island Patagonian toothfish fishery in particular (given the previous reference to the HIMI fishery). This small fishery is more complex than scientists first thought and there appears to be an *in situ* resident stock and transient stocks that move to and from the area (Australia 2002b). Scientists are unsure about the movement of fish between Macquarie Island waters, or whether the transient stock is an aberration. Regardless of this uncertainty, Respondents 52 and 66 question whether IUU fishers might access this fishery because the economic returns would be low. However, the apprehension of the Cambodian-flagged *Taruman*, suspected of illegally fishing around Macquarie Island in 2005, undermines their assertions and underscores the point that the high-Antarctic toothfish fisheries are targeted by IUU fishers are able, and choose, to access distant fisheries regardless of their size (Section 5.2.1).

Fishery managers do not have sufficient fishery information or management procedures to assess the sustainability of the high-Antarctic toothfish fisheries (Kock *et al.* in press; Respondents 49 and 65). For Respondent 26, scientists “have no idea about this species or its level of abundance in the fishery [although] the harsh Antarctic conditions and ... ice protect this fishery.” He also warns that the pressures for CCAMLR members to set high TACs to make this fishery economically viable could result in fishers inadvertently over-fishing the stock. Other respondents stress that neither the remoteness of the fishing grounds nor the extreme climatic Antarctic conditions affords any significant protection to toothfish (although ice-cover can limit the duration of fishing activities from January to April); and given that toothfish is valuable, IUU fishers will continue to target and take advantage of technological advances in fishing gear and satellite communications (Respondents 2 and 69).²⁸⁹ Respondent 4 also observes that the high-Antarctic waters are becoming a “fishing paradise” because IUU fishers are able to operate “very near to the [Antarctic] shore” because there is “no control ... no patrol vessels and no air surveillance” in these remote and extreme waters.

7.3 Performances of state actor-networks in CCAMLR

7.3.1 Stewards or toothless tigers of the toothfish fisheries

Some respondents consider that CCAMLR members act as stewards of the Southern Ocean fisheries because they have taken the lead in developing an ecosystem-based management approach and have developed CCAMLR such that it is now recognised by the FAO as an RFMO in its own right. For example, CCAMLR “has the most cohesive

²⁸⁸ For example, if the spawning population that provides juvenile fish to HIMI waters also populates stocks across the Kerguelén Plateau and around the Crozet Islands; IUU fishing will be widely felt.

²⁸⁹ In CCAMLR Sub-areas 88.1 and 88.2, 144 metric tonnes of IUU catch was reported in the 2004/05 fishing season (CCAMLR 2005f).

and balanced [RFMO] approach that has been exemplary” (Respondent 49). The OECD also states that “CCAMLR represents one of the most forward-looking initiatives in one of the largest and most difficult to administer regions” (OECD 2003a). In addition, CCAMLR members have set a number of global precedents for environmental management in terms of developing the GYM for the fisheries, reducing incidental bycatch and supporting the centrality of science in decision-making, whilst other RFMOs are still attempting to initiate approaches to concepts such as ecosystem-management, and to apply precaution into fisheries management decisions (see AAD 2005d; Molenaar 2001; Kock *et al.* in press; Scientific Certification Systems Inc. 2005; Small 2005). Moreover, the International Tribunal for the Law of the Sea expressly notes that it “appreciates the objectives ... taken by States, including the States Parties to CCAMLR, to deal with the problem [of IUU fishing]” (ITLOS 2002 §68). For Miller *et al.* (2004: 344), these efforts “stand out” as CCAMLR’s pre-eminent achievements, and Croxall and Nicol (2004) note that a recent assessment of RFMOs found that the environmental performance of CCAMLR has arguably the best record of these organisations.

However, CCAMLR’s evolution and success as an RFMO has not been without challenges. Notably, ENGO respondents are concerned that commercial and national interests may be driving CCAMLR members to diverge from the ATS and conservation objectives (Respondents 25, 26, 36, 41, 52 and 69).²⁹⁰ They also refer to the changing competency of the ATS and CCAMLR where CCAMLR is becoming increasingly uncoupled from the ATS because it has its own members and operates under its own mandate of promoting *rational use* and *conservation of the marine environment* where territoriality is not a prerequisite for achieving sustainable outcomes.²⁹¹ Conversely, the ATS has a *preservation* intent and addresses more strategic concerns including Antarctic territorial claims and the *comprehensive protection of the Antarctic environment* since the implementation of the Madrid Protocol (CAMLR Convention 1980; Madrid Protocol 1991). Given that CCAMLR has members that are not members of the ATS, it cannot be assumed that decisions taken in one forum will be accepted in the other.

For Respondents 48 and 68, this outcome has generated contradictions between the Convention on the Conservation of Antarctic Marine Living Resources and the ATS

²⁹⁰ Richardson (2005) questioned whether CCAMLR still accords with the ideals of the ATS or if commercial interests are driving CCAMLR to diverge.

²⁹¹ Some CCAMLR members are not members of the ATS (such as the EU and Namibia). In addition, Vanuatu has ratified the Convention on the Conservation of Antarctic Marine Living Resources (not chosen to become a member) and is not a member of the ATS; Canada and Greece are Acceding States to the ATS but have only ratified the Convention; and the Ukraine is a CCAMLR member but only an Acceding State to the ATS. Provisions for States not party to the ATS are included in the Convention on the Conservation of Antarctic Marine Living Resources where “[t]he Contracting Parties which are not Parties to the Antarctic Treaty acknowledge the special obligations and responsibilities of the Antarctic Treaty Consultative Parties for the protection and preservation of the environment of the Antarctic Treaty area” (CAMLR Convention 1980 Article 5(1)).

and has resulted in tension between actor-networks that promote environmental idealism and commercial gain (see also AAD 2005d; Wood 2003). In this sense, the two instruments are *squeezing* the conservation debate through their own OPPs and aligning different actor-networks in divergent webs that are linked by the Convention on the Conservation of Antarctic Marine Living Resources given that it falls under the ATS umbrella. For example, under the Madrid Protocol, environmental impact assessment (EIA) is mandatory for all proposed activities, visitors to the Antarctic are not permitted to impact upon flora and fauna and strict controls are placed on all forms of pollution (see Fallon & Kriwoken 2005). Under the Convention on the Conservation of Antarctic Marine Living Resources, an EIA is not required for fishing operations, endangered seabirds might be legally hooked on longlines a few kilometres away from visitors abiding by strict Antarctic EIA requirements, and there are few controls on marine pollution. This situation has resulted in considerable contestation between CCAMLR members and ATCPs. For example, they continue to debate whether the ATS should extend to the high seas and cover all Antarctic species (terrestrial and marine) or focus only on terrestrial (and freshwater) species, seals (on land) and seabirds and leave marine living resources under CCAMLR's mandate.²⁹² Despite this tension, some respondents advocate that CCAMLR members and ATCPs align the actor-networks and support the principles of both regimes regardless of their membership status to ensure the management outcomes are developed in a cooperative and complementary manner (Section 3.4.5).²⁹³

Other tensions between the actor-networks arise. For example, Respondent 26 argues that CCAMLR is strengthened by its ties to the ATS because the alliance fosters more conservation focused outcomes and helps CCAMLR to maintain independence from the mainly fisheries-oriented FAO process. However, Respondent 49 states that CCAMLR is becoming less bound by the ATS, and is becoming increasingly aligned to LOSC and the FAO because CCAMLR operates as an RFMO in accordance with the UN Fish Stocks Agreement Article 10 and its members have contributed to, and have benefited from, the IPOA-IUU and IPOA-Incidental Mortality (see also Vidas 2000). For him, CCAMLR members are working towards building connections with the FAO and adopting a comprehensive and non-discriminatory approach to sustainably managing toothfish stocks.

In this light, respondents identify that there have been major changes in CCAMLR since it was established in the early-1980s, particularly with regard to its overall conservation

²⁹² Other issues of competency have become more acute with the revision to Annex II of the Madrid Protocol in relation to the *Conservation of Antarctic Fauna and Flora* and if it can be applied to marine species. Although ATCPs have determined that for any species that are of interest to CCAMLR, then the Commission will be consulted, debate remains about the title of Annex II, and if it ought to be changed to the *Conservation of Antarctic Species* to allow the Convention on the Conservation of Antarctic Marine Living Resources to manage marine species.

²⁹³ To ensure cooperation between CCAMLR and the ATCM/CEP, the CEP chair is a CCAMLR Delegate and the SC-CCAMLR Chair is a CEP Observer (ATCM XXVII 2004 Item 4(25)).

and rational use objectives and the step-by-step approach that was adopted to implement measures that CCAMLR members and fishers would comply with. For Respondents 26, 29, 34, 52 and 53, CCAMLR and its members have moved through a number of phases. CCAMLR started with a fisheries management approach that considered ecosystem and conservation objectives. However, CCAMLR members had problems in defining these objectives (i.e. defining what the OPP might be). A major breakthrough occurred in the late-1980s to early-1990s with the application of the precautionary approach because it provided an effective interim OPP before developing the ecosystem-based management approach (see Constable 2005; Constable *et al.* 2000; Kock *et al.* in press). Finally, a phase of ecosystem-based management evolved during the 1990s and CCAMLR members gradually realigned themselves in the *CCAMLR Sub-network* to elevate CCAMLR as the head-actor-network that spoke on their behalf on issues regarding the management and conservation of Southern Ocean fishery resources, and to address new problematisations such as IUU fishing and fisheries bycatch. By implementing conservation and rational use objectives, CCAMLR members broke away from traditional fishery morality and MSY models to more functional and dynamic fishery models (CCAMLR 2004c, d; Respondent 26). Although these developments occurred when CCAMLR members were perceived by some actor-networks as moving away from conservation objectives, this change was driven by necessity and insight because the only way to implement the ecosystem approach was to compartmentalise problems and tackle each issue individually (Respondents 49 and 68). Other changes have occurred since 2000 in response to CCAMLR members needing to allocate access rights to limited toothfish stocks to more numerous fishers, and associate with new and increasingly influential actor-networks (including fishers and NGO campaigners) that have established more durable connections in the *CCAMLR Sub-network*.

As new actor-networks have become involved with CCAMLR their associations have extended the *CCAMLR Sub-network*. For example, Namibia (which is not party to the ATS and may fail to understand the environmental focus of this regime and whose nationals have allegedly been involved in IUU toothfish activities in the past) has recently become a CCAMLR member and taken measures to become a responsible fishing nation. In addition, the early-1990s was a defining period for CCAMLR due to the former Soviet Union releasing Poland and the Ukraine from its control (Respondents 2 and 34; Stokke 1996). This change altered the dynamics of CCAMLR because the Soviet Union historically held one vote in CCAMLR, whereas Russia, Poland and the Ukraine are now separate CCAMLR members and hold three votes in CCAMLR. As a result, these States can unite and exert greater power to influence debates in CCAMLR. The influence of other States and the power they exert in CCAMLR have also altered as their engagement in fishing activities altered. For Respondent 12, this “split personality” attributes to the *relative failures* of CCAMLR where unresolved conflict between actor-networks is caused by CCAMLR’s desire to be both a conservation and rational use regime. For example, the United States

Government wielded power differently when it was a conservative non-fishing State focused on conservation objectives for the collective good, and now it is more self-interested and promotes rational use since its nationals started fishing for crabs, krill and toothfish (Respondent 44).²⁹⁴ In addition, the German Government supported rational use when its fishers engaged in fishing, but has since adopted a conservation approach after fishing ceased.

Respondent 41 also suggests that the *relative failures* of CCAMLR are due to the “bureaucrats that make up the CCAMLR membership, ... are part of the old boys network, ... have been there for much too long ... and are being rapidly overtaken.” Respondent 36 refers to the *secret club mentality* of CCAMLR and ATCM members and states that for over 20 years these people and issues they discussed have been the same. CCAMLR has also been criticised in the UN, mainly by Malaysia which had a long-standing objection to the ATS. Criticisms peaked in the late-1980s and early-1990s when Malaysia asserted that CCAMLR members from developed States were part of the recalcitrant *Antarctic Club* that was keeping the fishery resources for itself (Respondents 2 and 50).²⁹⁵ Their comments are supported by Stokke (1996) who argues that among the main problems has been the perceived challenge from outside actor-networks to the prominent decision-making position of CCAMLR members that have come together in CCAMLR (as a head-actor-network) in matters relating to the region.²⁹⁶ The point here is that some CCAMLR members do resist the participation of new actor-networks in CCAMLR.

Nonetheless, the success and agency of CCAMLR as a head-actor-network rests upon the degree to which all the actor-networks comply with the initiatives and measures developed by CCAMLR members. With this in mind, 59 per cent of respondents consider that the conservation measures developed by CCAMLR members to manage the toothfish fisheries sustainably are insufficient and have not been applied effectively (Figure 5.6). Significantly, 83 per cent of scientists and researchers and 69 per cent of NGO representatives voice their concern that CCAMLR members have been unable to curb IUU fishing activities (Figures 5.7 and 5.8). In addition, licensed fishers describe CCAMLR as a *toothless tiger* where its members are not fishery managers but a large group of scientists that have not been able to take a hard line on any major issue (Respondents 6, 10 and 17). For Respondent 25, “CCAMLR has been a total nightmare” and “the only time [CCAMLR members] have closed areas is when there has been no fish left ... The *Notothenia rossii* fishery still hasn’t come back” (Section 3.4.2). These respondents argue that CCAMLR has many loopholes that its members

²⁹⁴ In the 2003/04 fishing season, the United States-flagged vessels *American Warrior* and *America 1*, owned by Mr Lawrence Lasarow, fished for toothfish (Gianni & Simpson 2005; Respondent 44).

²⁹⁵ The Malaysian Government has since resolved its differences with other ATCPs and now actively supports a cooperative Antarctic Research Program.

²⁹⁶ Regimes have been criticised because *exclusive gentlemen’s clubs* may oppose change and eliminate unpredictability (see also Darby 1994; Dodds 2000; Mansbach *et al.* 1976; Stokke 1997; Young 1989b).

are unable or unwilling to close. In this respect, science is not held as triumphant, and the traditional privileged authority of scientists is being increasingly questioned by other actor-networks who, in turn, are mobilising their own authority to deliver solutions to manage and conserve the toothfish fisheries. In addition, the process of governing by CCAMLR is not assured, enrolment remains precarious and the links and nodes in the *CCAMLR Sub-network* need constant maintenance, work and support (see Law 1999a). Although CCAMLR strives to speak on behalf of its members and other actor-networks, it does not necessarily represent their views nor does it necessarily silence their potentially dissident positions. Consequently, CCAMLR is not an ultimate head-actor-network in the *CCAMLR Sub-network* or wider *Patagonian Toothfish Network*.

7.3.2 The relative merits of CCAMLR consensus decision-making

One of the main loopholes perceived by respondents is the contested effectiveness of consensus decision-making in CCAMLR. As such, the governing rules of CCAMLR require consensus to be reached before action can be taken and this approach is unusual because most RFMOs require only a governing majority of two-thirds or more to take action (see Joyner 1992). Many respondents perceive *relative failures* in consensus decision-making because CCAMLR members not only reach decisions by consensus, they may also be the perpetrator defending their self-interested actions. For example, Respondents 12, 17, 19, 26, 29 and 58 consider that consensus decision-making is problematic because national interests impede or dilute the ability of CCAMLR members to agree and it allows one member to stop a majority vote or lead to the least stringent management options being supported. As such, members can evoke an opt-out clause that states: “if a member of the Commission, within ninety days ... notifies the Commission that it is unable to accept the conservation measure, in whole or in part, the measure shall not, to the extent stated, be binding upon that member of the Commission (CCAMLR Convention 1980 Article IX 6(c)). The clause gives each party a double-veto through which they can later exempt themselves from measure previously agreed to.

Consensus decision-making can also put “tremendous pressure on nations whose positions might normally lead them to break consensus to reach agreements to which all member nations can agree” and can be “a powerful tool in diluting national interests with respect to management measures on specific fisheries” (Scientific Certification Systems Inc. 2005: 13). In addition, the principles and norms associated with consensus decision-making can be “inherently conservative, environmentally ineffective and can actually delay decision-making” (Dodds 2000: 241). In addition, there may be States with only a tangential interest in toothfish fishing that unduly influence CCAMLR decisions. Likewise, a decision may not be reached through inertia or because CCAMLR members may not wish to set an international precedent that might be applied in other RFMOs (Respondent 26). Respondent 53 also warns that some fishers “don’t trust in the scientists, because they’re always introducing limitations to the fisheries”; Respondent 18 identifies that fishers consider some conservation measures

“to be a burden”; and Respondents 3 and 6 consider that overly stringent conditions reduce the capacity of licensed fishers to fish and plays into the hands of the IUU operators because it provides open access to the fisheries. These issues were raised by five per cent of respondents (Figures 8.2, 8.3 and 8.4). In response, Respondent 47 advocates the development of easily understood and practical conservation measures because some fishers will resist State-led governance arrangements and engage in IUU activities if they are an easier alternative than having to comply “with a myriad of complex measures.”

On the other hand, Respondent 49 states that consensus decision-making within CCAMLR is an easy target for criticism and an issue of perception. He explains that CCAMLR consensus decision-making has been successful given that nearly 100 decisions have already been adopted and the time taken to introduce these measures has been quicker than in many other RFMOs (for example: ICCAT, CCSBT or IATTC). In addition, consensus decision-making confers with internal legitimacy of the Convention on the Conservation of Antarctic Marine Living Resources because its members have equal standing (AAD 2005d), and *bad* decisions can be stopped if members vote against them (Joyner 1992). For Respondents 2, 25, 48, 52, 68 and 69, although consensus decision-making is slow (with conservation measures routinely taking three years to negotiate)²⁹⁷ and compromise is needed, the process encourages compliance. They point out that problems only arise when CCAMLR members hold self-interested, hidden or short-term agendas (for example: TACs that are set for national economical reasons). Moreover, the prevailing *moral mandate* attached to consensus decision-making, which presumes good, appropriate and responsible conduct, strives to provide CCAMLR members with every opportunity to connect with and contribute to any conservation measures adopted.

Some respondents consider other decision-making options that could be embraced by CCAMLR members such as adopting a majority vote (see also AAD 2005d). Respondent 41 refers to the majority decision-making and dispute-resolution procedures that have been developed by members of the Western and Central Pacific Fisheries Convention (WCPFC) as possible options. Here, key decisions requiring consensus decision-making (such as mandatory requirements, cVMS, and open and transparent vessel registries) are written into the WCPFC Convention. Alternatively, although Respondent 40 supports consensus decision-making because “it helps compliance”, and without it, the need for sanctions is greater, she contemplates the merits of CCAMLR members adopting a consensus minus one or consensus minus two decision rule. With consensus minus one, if one member is obstructive or acts in a self-interested manner, the other members can expel or suspend that member. The consensus minus two is used to force two members with a disagreement to resolve the dispute. With regard to the

²⁹⁷ An initial paper is put forward in the first year. A second paper is put forward in the second year to convince members of the need to act. In the final year, an initiative is put forward and agreed upon.

toothfish fisheries, she reasons that the consensus minus one decision rule might be helpful as a deterrent even if it were not used, particularly when one State fails to comply with CCAMLR initiatives. Respondent 2 supports the consensus minus one decision rule because it provides CCAMLR members with a mechanism to expel those members engaged in IUU activities, and Respondent 16 suggests that members adopt this rule “to ensure that no one State can veto a management or conservation initiative.” Conversely, this rule could become corrupted if it was used as a veto and dissenters were not *morally* obliged to comply, or some States could *buy* another State’s vote.

Respondents highlight that issues regarding the relative merits of applying consensus decision-making are problematic and contested. It is not just the time it takes CCAMLR members to agree upon decisions, but also keeping members engaged in the negotiation process, the strength of the decisions they reach and their ability to apply sanctions to, or expel, non-complying members that are important. Many respondents consider that consensus decision-making leads to outcomes that members support and are able to implement. Others consider that it can prevent CCAMLR members making tough decisions due to the difficulties involved with reaching full agreement. This discussion illustrates that the social and political dimensions to CCAMLR are constantly changing. Given this flux, CCAMLR members may need to mobilise resources and/or the support of other actor-networks if they are to implement recommendations or mechanisms (i.e. implementing the eCDS) agreed to by consensus and adjust to new ways of thinking fishery management concepts and ways of doing business.

7.3.3 Privileging State rights over State responsibilities

States that privilege national rights over their responsibilities to manage and conserve toothfish stocks for the common good exacerbate tensions between States with an interest in the toothfish fisheries and render the connections between various actor-networks in the *Patagonian Toothfish Network* precarious. In this light, Respondent 28 contends that “the growing IUU problem shows that the RFMO approach by itself is no longer adequate” and Respondent 40 thinks that the objectives and policies can fail in CCAMLR because one State can veto consensus decisions in return for concessions (see Taylor 1984). In addition, coastal States continue to act unilaterally when they evoke the *Chairman’s Statement* to their own advantage (Section 3.5.3). This situation underscores the point that although the Convention on the Conservation of Antarctic Marine Living Resources may erode some aspects of sovereignty to promote extraterritorial responsibility, some members continue to privilege State rights over State responsibilities, and when cooperating for material advantages they calculate whether there is more to gain from cooperation than from withdrawal or conflict (see Choquet 2003; Jupille 1998; Lugten 1997; Stokke 1996; Vidas 2000). This bifocal approach allows States’ authority to remain intact because States retain the right to become a Party to the Convention, but can act dissidently in their own self-interest by vetoing decisions or demanding particular requirements from the regime. These

loopholes compromise the Convention on the Conservation of Antarctic Marine Living Resources as an OPP and the ability of CCAMLR to act as a head-actor-network.

Therefore, the Convention on the Conservation of Antarctic Marine Living Resources is only as effective as the participants want it to be. In addition, there are no effective mechanisms to set standards or discipline those States that do not perform to even the very basic expectations that would seem to be obvious implications of the Convention on the Conservation of Antarctic Marine Living Resources. Although, with sufficient agreement and commitment to act, multilateral pressure can move national views. In terms of CCAMLR, the Patagonian toothfish and IUU fishing, there are some States (such as Spain, Russia, Ukraine, Uruguay and the Republic of Korea) that are benefiting from the status quo and others that are concerned to fix problems (such as Australia, New Zealand, South Africa and the United Kingdom) mostly because their self-interests are at risk, but also because they promote a *moral mandate*. However, IUU fishing is a lesser concern to other States (such as Germany, India, Italy and Sweden) compared with the States above because they do not engage in fishing (Respondent 8).

Issues of national interests driving toothfish allocation debates in CCAMLR are exemplified by the efforts of the United Kingdom to control the South Georgia Patagonian toothfish fishery. Here, the British Government maintains that the TAC is sustainable despite other CCAMLR members identifying errors in the stock assessment methodology in this fishery (CCAMLR 2004c §5.155; AAD 2004a) (Sections 7.2.2 and 7.2.5). In particular, the United States delegation concluded that any catch above zero for the 2004/05 fishing season was not precautionary given previous inconsistencies in the scientific data (CCAMLR XXIII 2004a §10.51). The SC-CCAMLR also stated that whilst a considerable amount of work had been completed to improve the stock assessment methodology for this fishery in 2004/05, *substantially more* had to be done “in order to generate advice for a specific catch limit for *D. eleginoides* in Sub-area 48.3” (CCAMLR 2005d §4.55). As such, there is little point developing paper-based stock assessment mechanisms and calculations when the resultant TAC limit ought to be zero because the fish stocks have been depleted to commercially non-viable levels.

However, members of the United Kingdom delegation disagreed, and their assertion that a TAC of 3,050 metric tonnes was sustainable for this fishery held great power in CCAMLR because its members approved the catch level (CCAMLR XXIII 2004a).²⁹⁸ Rather than considering the biological sustainability of the toothfish alone, the British Government sought to maintain the revenue base for the SGSSI Government from fish licences. In this vein, Respondent 40 states that it would be difficult for the SGSSI Government to fund surveillance and enforcement operations without these funds. Therefore, the United Kingdom is reluctant to close the fishery for political and

²⁹⁸ CCAMLR members set a TAC of 2,489 metric tonnes for the 2005/06 fishing season (CCAMLR 2005g).

financial reasons although it has supported reductions to the South Georgia TAC (from a peak of 7,800 metric tonnes in the 2002/03 fishing season) because scientific uncertainties and data errors in the assessment methodology have needed it to be recalculated.²⁹⁹ Moreover, the United Kingdom takes a bifocal stance in relation to managing the South Georgia Patagonian toothfish fishery. In an effort to justify setting a TAC to generate revenue to manage the fishery, the British Government relinquish power to the less contentious and financially powerful SGSSI Government. However, the British Government maintains its influence in CCAMLR and other international fora to ensure that its territorial interests and ability to exert power are protected.

Although certain States bias their efforts, some respondents also consider the efforts of their respective national governments to manage Patagonian toothfish fisheries under their direct control or spheres of influence as extemporary. For example, Respondents 2 and 40 who are based in the United Kingdom consider that United Kingdom authorities have implemented effective toothfish management of the South Georgia Patagonian toothfish because the Government of SGSSI exercises control over its licence holders, can licence who it chooses, is able to enforce conditions on fishing activities and conducts both Government of SGSSI and Convention on the Conservation of Antarctic Marine Living Resources fishery inspections.³⁰⁰ Then again, Respondent 58 from France considers that the Kerguelén and Crozet Islands toothfish fisheries are some “of the best managed fisheries in the world because the fees that are provided by the fishers to the La Réunion Island Government are injected directly back into managing the fishery.” On the other hand, Respondents 19 and 34 who are based in New Zealand suggest that the New Zealand Government has a well developed toothfish management system. For them, the management system exceeds the requirements of CCAMLR, particularly with regard to requiring that fishers submit a full EIA to assess the potential impacts that fishing activities might have on the environment prior to undertaking fishing activities. Moreover, Australian Respondents 23, 29 and 59 state that the Australian Government exceeds the requirements of CCAMLR, and considers other issues including MPA and World Heritage Area (WHA) provisions, offal discharge and the introduction of exotic species and diseases. For Respondent 59, the approach being applied by Australian authorities “are amongst world best practise.”³⁰¹

However, the claims of these respondents are contested by others who argue that although these developed States advocate their own fisheries as sustainable, have

²⁹⁹ The SC-CCAMLR is examining the suitability of applying the C++ Algorithmic Stock Assessment Laboratory Model (CASAL), which uses multiple data sets to take ecosystem management and operational complexities into account, to improve toothfish assessments and reduce criticisms of current assessment models (CCAMLR 2005f).

³⁰⁰ For Respondent 40, the United Kingdom licences national and international fishers and is the only CCAMLR member that conducts national and CCAMLR vessel inspections. Most other CCAMLR members only licence their national fishers and patrol their national waters in the Convention Area.

³⁰¹ Measures for SFRs include prohibiting commercial fishing within 13 nautical miles of HIMI; establishing TACs to ensure stock sustainability; conducting ecological risk assessments; complying with bycatch triggers; and avoiding pollution or losing gear (AFMA 2003b, c).

denounced IUU fishing and are powerful sub-networks in CCAMLR, the sustainability of the entire toothfish fishery remains uncertain. In addition, although many States do not specifically apply EIA requirements to the fisheries *per se*, they do apply arguably equal stringent environmental procedures (Respondent 44). Respondents 25 and 49 also mention that in 1998, when the Ross Sea fisheries for toothfish were first opened, New Zealand authorities were perceived by other CCAMLR members as being “restrictive in not allowing vessels from other countries into that fishery.” For them, if this inequitable situation had prevailed in this high-seas fishery New Zealand would have been politically ostracised in CCAMLR. Other problems of equity also arise, particularly when considering that some States have requested an increase in TAC levels for Patagonian toothfish in some areas to benefit their own fishers (see Dodds 2000). Collectively, their actions highlight that appropriate territorial/ecological frameworks are being conditioned by sovereignty claims, national interests, politics and economics where States seek to retain their legal rights to fish the global commons and *finders’ rights* to secure access to the fisheries. Instead, Respondent 26 suggests that these States have an opportunity to become *honest brokers* in terms of leading the implementation of CCAMLR conservation measures and sharing global wealth with States that are less fortunate.³⁰² The salience of this point is that developed States have an opportunity to secure their international status as powerful actor-networks by relinquishing national exclusivity based on colonial control, domination and exploitation. Alternatively, they could act responsibly, advance a *moral mandate* and strive to share power, knowledge and resources with States that may not have access to common fisheries or the capacity to effect change or act in a sustainable manner. This is important because developing States, including coastal States, are equal global partners that are likely to claim high seas fishing rights in the future and, if excluded from these fisheries, might contest or resist regulatory measures and/or choose to engage in IUU activities (see Dean 1999; HSTF 2006; Strigl 2003).

This discussion highlights that as the *CCAMLR Sub-network* becomes larger and increasingly heterogeneous, stability is only achieved if human actors are reluctant to break the associations they form in the actor-network and perceive such connections as paramount to maintaining their power (see Holm 2001; Stadler 1997a). Therefore, CCAMLR members maintain power and stabilise their position of influence by remaining enrolled in the CCAMLR toothfish management debate, and by acting as a collective to render the *CCAMLR Sub-network* durable. By doing so, they sometimes compromise their individual positions regarding contentious decisions. Paradoxically, CCAMLR members have differing scientific and political imperatives in relation to managing the toothfish fisheries. Consequently, some CCAMLR members may not wish to concede authority to CCAMLR, and they effectively wield considerable power

³⁰² For Young (1989b:74-75), “reputation for trustworthiness is one of the most valuable assets that any members of an international society can acquire ... the costs of being stigmatised by others as a rule-breaker may be quiet severe.”

and act in a dissident manner to manipulate issues and influence other members and national governments to support their self-interested positions and destabilise both the *CCAMLR Sub-network* and wider *Patagonian Toothfish Network*.

7.3.4 Difficulties in managing high seas resources

Eighty-three per cent of officials, fishery managers and scientists, 44 per cent of NGO representatives and 39 per cent of fishers recognise that it is easier to manage Patagonian toothfish fisheries found in waters under national control than those found on the high seas (Figures 5.6, 5.7 and 5.8). However, they stress that managing the toothfish fisheries found on the high seas in international waters (particularly around the Antarctic continent south of 60°S) is a significant and increasingly difficult problem that has been avoided by CCAMLR members. For them, managing the high seas stocks is paramount to ensure the sustainability of these species, and it is against this backdrop that they consider complex and contested issues associated with how to reconcile conflicting interests and demands when equitably allocating toothfish fishing opportunities. Politics and economics fuel the respondents concerns. For example, Respondents 23, 41, 56 and 69 contend that one of the great fallacies of the fishing industry is that the industry owns the resource. However, the fisheries are owned by the community and if the stocks are to be exploited, they ought to be exploited on behalf of those communities. However, Respondent 49 argues, that “to advocate that because the high seas [fisheries] are ... owned by everyone and, therefore, no one should be given exclusive access to the resource is wishful thinking.” In addition, Respondent 16 states that “if management of the high seas is not effective, then access rights are valueless ... and it is important to ascertain how these rights maintain value” over the long-term.

Problems related to allocating high seas toothfish stocks are illustrated by Respondents 29, 55, 57, 59 and 70 who reflect upon the events of 2003, when CCAMLR members assessed 32 nominations to fish in the Ross Sea and 17 nominations to fish CCAMLR Sub-area 58.5.2 outside the Australian HIMI.³⁰³ They also identify that this fishery has become so crowded that vessels now set their longlines parallel to one another and the lines are crossing over each other. Respondent 10 opens up the discussion and argues that in his estimation, when fishers are negotiating with CCAMLR and its members “it is very difficult to achieve equitable, environmentally sustainable or politically unified outcomes” because decisions are ultimately made by consensus among Parties, some of whom may harbour and legitimise the activities of IUU operators by their membership in CCAMLR (see Gianni & Simpson 2005; Respondents 4, 8, 11 and 15).

Some respondents have problems with the terminology associated with equitable allocation of toothfish resources, but refer to fishery access rights on the high seas in

³⁰³ Although Respondents 55 and 57 state that the number of fishers seeking access to the high seas fisheries may decrease because they are now required to pay a CCAMLR application fee of US\$6,000, other respondents contest this assertion due to the high returns of the fisheries.

terms of output rights that provide numerical rights to catch a specific TAC, possibly in the form of ITQs or SFRs. Here, privatisation of resources is seen as a significant solution to property rights dilemmas in the toothfish fisheries (see Davidse 1999; Mansfield 2004; Sandler 1997). The 2000 SoFIA Report (FAO 2000: no page) takes a similar approach and sets out this problematisation where:

There is a growing realization that part of the remedy to this management problem lies in designing appropriate access rights to wild stocks ... the basic concept of property and the rights associated with property is ... simple. So-called 'property rights' are bundles of entitlements that confer both privileges and responsibilities.

As such, ITQs or SFRs have considerable transformative powers. This is because they provide perceived mechanisms to regulate over-fishing, over-capacity and high management costs and promote a modern, rational and economically predicable fishing industry. In this new industry, members – the new class of wealthy and trans-national fishery operators – are increasingly engaging themselves in political processes, since the return on their investment depends on their capacity to influence other actor-networks and monopolise the management debate. However, Holm (2002: 17), describes the “invention” of ITQs and SFRs as “powerful and attractive as well as terrifying and repulsive” because the fish (and in this case the Patagonian toothfish) “which previously was regarded as a common heritage ... is expropriated, without compensation, and given, free of charge, as private property to a small elite.” He also points out that such dispossession leave the crew radically separated from the fish because wealthy and trans-national fishery operators control exclusive access to the resource. For Holm (2002: 19), the ITQ model generates its own sub-network that has negative consequences because certain actor-networks are manipulated to betray their roots, ‘since it redefines nature to fit its image.’

With this concern in mind, Respondent 26 also reflects upon those States that might fear the impacts of conservation measures on the high seas fisheries because they may miss out on resource allocation, and the application of the UN Fish Stocks Agreement because it seeks to restrict access to the fisheries. He argues that some States, like Argentina, aggressively protect their self-interests, have already taken substantial benefit from the high seas fisheries, and are unwilling to relinquish their sovereign and high seas fishing rights, which are conferred upon them under LOSC. As such, Argentina provides an example of how States mobilise the legal form of sovereignty to increase their power in the *Patagonian Toothfish Network* because it has been used as an instrument and justification to control maritime spaces over and against the collective good. Then again, Respondent 68 thinks that States “are worried that they may lose control of their own fisheries.” For example, although Australia controls national toothfish fisheries within the Australian maritime zones, if the stocks are verified as being part of a meta-population that straddled multiple jurisdictional areas, the stocks may need to be managed cooperatively with other States and organisations. Were this to occur, Australia might be compelled to relinquish exclusive control over

the fisheries and Australian toothfish fishers might fear that fishers from another State would access their own stocks. Both actor-networks could lose substantial power in the national sub-network of actors managing the Australian toothfish fisheries and the Australian Government could lose its status as a head-actor-network. Fear could become magnified if other States that were perceived as managing their own stocks poorly, were able to access Australia's well managed fisheries, or if Australia was allocated less stock to make up for another State's poor management.

This discussion highlights conflicting philosophical issues of equity, self-interest and like-mindedness. Respondents remain unsure about how to manage effectively the fisheries, and they consider that although CCAMLR members have developed processes and procedures to manage these stocks, getting agreement by all States to fully implement the initiatives has proved difficult and ineffective in stopping IUU fishing. Many respondents also acknowledge that IUU fishing, particularly on the high seas, contravenes international standards such as LOSC (see Mansfield 2004; NOO 2003) (Section 5.3.2). They also acknowledge that the UN General Assembly does not have the power to administer toothfish stocks either globally, regionally, or within national maritime waters and it is through LOSC that the UN has strongly recognised the head-actor-network role of CCAMLR in Part XII Articles 197-201, which focuses on State obligations to cooperate with another and conserve living marine resources found on the high seas (LOSC 1982). In addition, LOSC Part VII Article 92 states that vessels that sail under a legitimate flag shall be subject to exclusive jurisdiction on the high seas (LOSC 1982). This long-standing principle means that the only State allowed to "board, inspect, arrest or prosecute a vessel on the high seas, unless otherwise agreed, is the flag State" (Churchill 1998: 233). In this regard, LOSC recognises the right of all States for their nationals to fish on the high seas (see Hayashi 1999). However, it leaves the management of high seas fisheries to flag States despite some being unable to enforce strict measures to manage these fisheries because they are unable or unwilling to enact adequate national laws (Respondents 28, 40, 61 and 70). Moreover, LOSC can hide illegal activities, such as IUU fishing, illegal immigration or pollution, because there are limited opportunities by which to act against vessels on the high seas (ABC 2005b; Respondent 58; Stokke 1999).³⁰⁴ For Respondent 12, until the UN asserts authority and "signs on to management of the high seas" (rather than assigning authority to CCAMLR), CCAMLR members will be hamstrung by those who continue to resist effective high seas fisheries management, "even where they know it will lead to the demise of toothfish stocks in some areas."

In this light, Respondent 49 points out that interpreting LOSC with regard to the high seas is problematic because States are unable to agree upon *what is a national?* For example, there are no nationals of the EU because only member States have nationals.

³⁰⁴ LOSC provisions apply to piracy, unauthorised broadcasting on ships, major pollution incidents, slave and drug trafficking and treaty rights (LOSC 1982). *Hot pursuit* of a foreign vessel may be undertaken when a coastal State believes that the vessel has violated the laws and regulations of that State.

He points out that the South East Atlantic Fisheries Organisation (SEAFO) refers to nationals and national industries in the same way as the UN Fish Stocks Agreement. However, SEAFO also says that if a member of a Regional Economic Integration Organisation (REIO) (such as Spain being a member of the EU) flagging a vessel fails in terms of the nationals onboard, because of the REIOs competency over fisheries matters, it will assume responsibility for those actions where:

Flag State means ... a regional economic integration organisation in which vessels are entitled to fly the flag of a member State of that ... organisation ... and all its member States have transferred competence over matters covered by this Convention, including the authority to make decisions binding on its member States in respect of those matters (SEAFO 2003 Article 1 m(ii) and (o)).

For Respondent 49, the subtle change in the interpretation of what constitutes a national in the SEAFO Convention has implications for CCAMLR members. Within CCAMLR, the EU absolves its legal responsibility because fishers onboard a vessel in violation of CCAMLR measures are the nationals of a particular State and, therefore, their actions remain a State issue. This situation again illustrates that States can act in a bifocal manner. They join organisations such as LOSC or the EU to increase their power in international fora but retain control over national interests and resist conceding authority to IGOs to protect their self-interests. However, the SEAFO interpretation could potentially be applied to the Convention on the Conservation of Antarctic Marine Living Resources in the future and nationals based in a EU member State could be held accountable for their actions (Respondent 49).

Therefore, lack of compliance and disciplinary power, particularly on the high seas, is an intractable problem in CCAMLR due to the inability or unwillingness of some CCAMLR members and non-Contracting Parties to regulate the activities of their flag vessels or take action against their nationals that fail to comply with CCAMLR measures (see Churchill 1998; Kock *et al.* in press). These problems are of particular concern for over half the respondents and they identify that CCAMLR has no enforcement capacity to ensure that its members act responsibly, legitimately or for the common good (Figures 5.7 and 5.8). For example, Respondent 68 states that:

For waters ... on the high seas but inside the Convention Area, "there is almost no chance of an illegal fisher, whether or not they are apprehended or not, having any redress except for modest or heavy embarrassment of the flag State ... and if this State is not a member of CCAMLR the embarrassment is negligible.

As a result, CCAMLR members including Spain, Russia, Ukraine and Uruguay undermine the credibility of the Convention on the Conservation of Antarctic Marine Living Resources by supporting IUU fishing activities, including IUU operators on their delegations and/or permitting fishers to operate in both licensed and IUU fleets. In addition, CCAMLR members are unable to legally enforce conservation measures on third party or FOC vessels fishing on the high seas within the Convention Area (see DeSombre 2005; Vidas 2000). The situation becomes more complicated (and

controversial) when non-Contracting Parties to the Convention on the Conservation of Antarctic Marine Living Resources are permitted to fish. For example, as a cooperating but non-Contracting Party to the Convention on the Conservation of Antarctic Marine Living Resources, the Cook Islands sought access to new and exploratory fisheries in 2005 at the twenty-fourth CCAMLR meeting (see AAD 2006; CCAMLR 2005e).³⁰⁵ By CCAMLR members permitting the Cook Islands to access the fisheries, its incentive (and the incentive of other CCAMLR non-Contracting Parties) to become a CCAMLR member may be reduced. In particular, Respondent 26 describes cooperating non-Contracting Parties whose fishers access CCAMLR fisheries as *free-riders* who do not contribute to fishery assessments or CCAMLR conservation measures (see Churchill 1998).³⁰⁶ Unregulated vessels registered to third party States are also able to fish in the Convention Area with impunity given that they are protected by the Vienna Treaty, which states that treaties do not create obligations for a third State without its consent (Vienna Treaty 1969 Section 4 Article 34).³⁰⁷

Moreover, Rothwell (1998: 5) points out that the application and enforcement of international and domestic laws in the Southern Ocean are “more complex than in any other comparable maritime space.” Furthermore, difficulty remains in determining how other legal instruments created under LOSC and international environmental law are recognised and implemented in relation to CCAMLR (Dodds 2000; Fallon & Kriwoken 2004).³⁰⁸ In an effort to enforce global compliance, LOSC has established an international dispute-resolution procedure where each party to a dispute may request dispute settlement, the other party must attend, and the procedures are *binding* (Kimball 2003).³⁰⁹ There is also a dispute-resolution procedure in the Convention on the Conservation of Antarctic Marine Living Resources that states:

Contracting Parties shall consult ... with a view to having the dispute resolved by negotiation, inquiry, mediation, conciliation, arbitration, judicial settlement or other peaceful means ... any dispute of this character not so resolved shall ... be referred for settlement to the International Court of Justice or to arbitration; but failure to reach agreement ... shall not absolve Parties to the dispute from ... continuing to seek to resolve it (CAMLR Convention 1980 Article XXV).

The dispute-resolution process of the Convention on the Conservation of Antarctic Marine Living Resources closely resembles the Antarctic Treaty, where Article XXIV

³⁰⁵ DeSombre (2005: 73) identifies that traditional approaches of persuading “non-member flag States to join international agreements, has met with little success” and FOC vessels are “increasingly undermining the ability of fishery conservation organisations to manage fish stocks.”

³⁰⁶ *Free-rider* is an outcome that is socially constructed.

³⁰⁷ However, CCAMLR Article X allows CCAMLR members to draw attention to any non-party State that its vessels are fishing within the Convention Area and encourage them to join the Convention.

³⁰⁸ For example, Parties have yet to ratify the UN Fish Stocks Agreement and Compliance Agreement, they only extend as far as the willing voluntary parties are prepared to bind themselves and States remain free to interpret what is reasonable behaviour for flag States (see Dodds 2000; Gianni & Simpson 2005; Miller *et al.* 2004; Naturvernforbundet 1997; OECD 2003a).

³⁰⁹ The four options are the International Court of Justice, International Tribunal for the Law of the Sea, an arbitral tribunal, and a special arbitral tribunal.

provides for an arbitration tribunal to settle disputes as well as the standard Antarctic Treaty options of referral to the ICJ or to arbitration (CCAMLR Convention 1980). Respondent 49 points out that, because the Convention on the Conservation of Antarctic Marine Living Resources is linked to the 1945 Charter of the United Nations, if there was a dispute between CCAMLR Parties with respect to some other Party it could possibly be taken to the UN for consideration and debate. However, dispute resolution is not compulsory under the Convention on the Conservation of Antarctic Marine Living Resources and, consequently, States in dispute are able to continue fishing as long as the dispute continues. This loophole in the Convention on the Conservation of Antarctic Marine Living Resources maintains the power of CCAMLR members to protect their self-interests and the interests of their nationals fishing for toothfish. In addition, no dispute has been taken to the UN nor has a precedent been set and, until a specific dispute is invoked, the ability of the UN or ICJ to resolve disputes or exert power to control dissident States is difficult to predict.

7.3.5 Problems of transparency and data sharing in CCAMLR

Respondents identify that other problems with CCAMLR are associated with a lack of transparency and data-sharing within the Commission and between members, particularly when the data forwarded to the Secretariat is not correct or submitted in a consistent format. The availability of data is an important issue because their abstractions (numbers, categories, representations and other forms) are able to cross political and non-political domains, can help actor-networks to remain free and informed or provide stability and recurrence to the knowledge resources available. As such, data permits actions to be taken at a distance which “may promote outcomes that somehow accord with these knowledge forms” (Murdoch 2000). In particular, data can stabilise State-led sub-networks or positions because governments can pull information about the world towards the State’s *centres of calculation* to influence other actor-networks.

Therefore the multiple ways of calculating and measuring the toothfish and translating information across spatial scales is problematic because it is not equitably distributed. Nor has it necessarily stabilised knowledge about the toothfish. As such, Respondent 49 considers historical issues of scientific impartiality within CCAMLR when the former Soviet Union was a power block and CCAMLR member until the early-1990s. He recalls that CCAMLR members were able to submit *hot* science that they promoted as being more accurate than what was available from the SC-CCAMLR for their own political gain. For him, given that the SC-CCAMLR has a responsibility to present all information submitted to the Commission, CCAMLR members needed a strategy to combat any politically motivated scientific manipulation. Consequently, they referred to CCAMLR Article IX and considered the information of the SC-CCAMLR as the “basis of the best scientific evidence available” (CCAMLR Convention 1980 Article IX 1(f)). By adopting this stance, the SC-CCAMLR was able to present all data submitted to it,

but also point out the risks attached to each view presented (see also Stokke 1999). However, this discussion assumes that only historical data submitted to CCAMLR was *hot* science and it remains to be verified whether certain actor-networks continue to promote *hot* science to mobilise undue power in CCAMLR in an effort to protect self-interested positions. In addition, some NGO respondents maintain that CCAMLR does not seek transparency and contest the knowledge claims made by CCAMLR members. For them, the Secretariat needs to refrain from modifying SC-CCAMLR data before CCAMLR embodies these actor-networks through a single inscription device (the annual CCAMLR Report), and the SC-CCAMLR needs to justify TAC limits by providing the proprietary data (see also Dodds 2000).³¹⁰ However, it is questionable whether more data will solve issues of *hot* science and inaccurate information manipulating CCAMLR proceedings.

Respondent 2 also refers to the SC-CCAMLR's and its members' efforts to reduce the cost and size of its scientific reports, which has subsequently led to detailed scientific information being placed in background documents and not being translated from English to other languages or made publicly available. This point highlights that the most powerful actor-networks in CCAMLR tend to be those that speak English (Respondent 34). Participants to the 2005 *CCAMLR Symposium* held in Valdivia, Chile also noted that institutional reform is required within CCAMLR to support the increased workload of the SC-CCAMLR (AAD 2005d), especially given that the 2005 WG-FSA report was long and ran over budget, and the SC-CCAMLR sought advice from CCAMLR with regard to its content and the possibility of reducing costs by publishing translated versions electronically on the CCAMLR Internet website (CCAMLR 2005d §13.18-§13.25). Nonetheless, some respondents argue that CCAMLR meetings need to be accessible to all relevant actor-networks, and a centralised, comprehensive, reliable and publicly available data set ought to be widely available to foster shared meanings and ensure the openness and transparency of CCAMLR.³¹¹ However, problems arise in respect to the degree to which the SC-CCAMLR informs CCAMLR, whether CCAMLR members heed the advice of the SC-CCAMLR, and the will of actor-networks in both fora to relinquish knowledge and cooperatively share power with other actor-networks (Respondents 2, 40 and 52).

The lack of transparency, data availability and power-sharing in CCAMLR is exemplified by the events that took place during October 2003 at the twenty-second CCAMLR meeting when CCAMLR members created a disjuncture in the *CCAMLR Sub-network* and resisted the participation of a new actor-network by staunchly challenging its knowledge claims. Here, the COLTO observer submitted the *Rogues*

³¹⁰ Tensions have emerged regarding CCAMLR needing to base decisions upon information and advice from the SC-CCAMLR, and whether the opinions of the SC-CCAMLR "should be accepted as fact" by CCAMLR members or whether they are able make their own judgments (Rothwell 1998: 21).

³¹¹ Respondent 2 states that it is possible to download electronically the details from all working group meetings on the International Council for the Exploration of the Sea (ICES) Internet website.

Gallery document, which had already been publicly released. The document caused substantial debate at the meeting (CCAMLR XXII 2003a §14.25-§14.43). Most significantly, Uruguayan delegates exerted State power to protect national interests when seeking to invoke Rule 35(c) of the Convention on the Conservation of Antarctic Marine Living Resources *Rules of Procedure* under which documents shall only be considered as CCAMLR documents if so decided by the Commission (CCAMLR 2003b Part VI; 2005k Part VI). The Uruguayan delegates rejected the document because it was perceived to contain “accusations made in an extraordinarily rash and careless manner”, and argued that it was unacceptable “that an organisation not bound by current international instruments in the same way that the aforesaid States are bound should accuse the institutions and the officials ... of being involved in such activities with no valid evidence or obvious impartiality” (CCAMLR XXII 2003a §14.28).

The CCAMLR member States of Argentina, Chile, Namibia, Republic of Korea and Russia, with the Contracting Party State Mauritius, and non-Contracting Party State China, also expressed concern that the *Rogues Gallery* document made serious accusations without demonstrable proof and had the potential to undermine the credibility of CCAMLR and the efforts of national governments to combat IUU activities. Some States’ representatives commented that the document was divisive, inconsistent, misleading, inaccurate, irresponsible, overly frank, unwarranted and lacking in impartiality. In contrast, the CCAMLR members of Australia, the EU, France, New Zealand, Spain, the United Kingdom, and the United States contested the claims made by other members who resisted COLTO’s participation as an observer to the CCAMLR meeting, acknowledged its significant industry knowledge and reiterated that IUU fishing activities harm CCAMLR’s credibility. These States viewed COLTO as helpful in preventing IUU fishing, enhancing the objectives of CCAMLR, and promoting trust between the Commission and the fishing industry.

Responding to the Uruguayan delegation, a United Kingdom representative indicated that the potential invocation of Rule 35(c) against COLTO’s document was regrettable because it could compromise and destabilise open discussions in CCAMLR meetings and in the ATCM. He stated that:

∴ although legally such a procedure might be applicable, such a proposal presupposed that the Commission had in place a mechanism to evaluate and adjudicate reports submitted by observers ... in reality, the Commission had no such procedure, nor had it been the practice to censor or block such reports (CCAMLR XXII 2003a §14.41).

Consequently, in response to the powerful interventions made by CCAMLR members and Contracting and non-Contracting Parties, and to avoid a precedent being invoked in relation to the potential invocation of Rule 35(c), COLTO worked through the OPP established by the Convention on the Conservation of Antarctic Marine Living

Resources *Rules of Procedure*, withdrew the *Rogues Gallery* document, and suggested that:

... all references in the draft Commission text for discussion be renamed 'the COLTO document', as a pragmatic solution and way forwards ... to avoid this situation occurring in future, COLTO will ... provide detailed, accurate and timely information to the Commission for consideration by members in relation to the IUU black list and other IUU topics (CCAMLR XXII 2003a §14.43).

CCAMLR members noted COLTO's statement and recommended that it should approach the Commission with a request to attend CCAMLR-XXIII, cautioning that COLTO's application would be dealt with in strict compliance with Rules 30-35 of the Convention on the Conservation of Antarctic Marine Living Resources *Rules of Procedure* (CCAMLR 2003b Part VI; 2005k Part VI).

Nonetheless, COLTO's claims have since been largely verified by government sources, and at the twenty-third CCAMLR meeting in 2004, CCAMLR members approved COLTO's request to attend the meeting as an official NGO observer on the first day of the SC-CCAMLR (Exel 2004b). COLTO attended all of the official proceedings of CCAMLR-XXIII. However, having gained official NGO status, COLTO observers, along with other non-CCAMLR observers, were not permitted to attend *informal* CCAMLR working group meetings where conservation measures or drafting issues are finalised and for which no record of proceedings is tabled.³¹² Paradoxically, other fishers who are members of COLTO were permitted to attend the meetings because they were included on CCAMLR member State delegations (Respondents 12 and 16). This is an important point because non-Contracting Parties were restricted from the *informal* meetings, and other Contracting Parties such as The Netherlands, Peru, and Mauritius (CCAMLR's newest addition) were also restricted from the meetings despite those States being legally bound by CCAMLR and its management principles.³¹³ For Respondent 50, this situation compromises the very principles of open discussions and transparency which CCAMLR members strongly advocate. It also raises issues of participation and power-sharing because the ability of CCAMLR members to liaise with and educate other actor-networks about contentious issues or cooperate with Contracting and non-Contracting Parties who might be considering full CCAMLR membership is compromised. Finally, it has embarrassed delegates and officials who question the overall benefits of such an approach (Respondent 50). In addition, when the ASOC observer requested time to address delegates at CCAMLR XXIII, the Chair failed to provide an opportunity for the observer to speak and only permitted the ASOC observer to submit a written statement to CCAMLR (Respondent 50).

³¹² The CCAMLR Conservation Measures Working Group (the Wombat Room) is a small group that focuses on drafting conservation measures out of the public's gaze (Exel 2004b). Most CCAMLR delegations now attend the group because it can discuss contentious issues (Respondents 12, 16 and 50).

³¹³ All parties and NGO observers can attend sessional and inter-sessional ATCM meetings.

7.4 Performances of non-state actor-networks

7.4.1 Profits determine how fishers choose to operate

Fishers are firmly established in all the sub-networks described in this investigation, and increasing their associations and connections in the wider *Patagonian Toothfish Network* to further their self-interests and gain access to valuable toothfish resources. In this vein, ENGO representatives focus on how fishers conduct their toothfish operations and argue that they are wealthy and exert considerable power in CCAMLR because they form part of national delegations and State-led sub-networks and are able to influence national governments (Respondents 25, 36, 38 and 52). Fishers also actively chose to operate legitimately or illegally depending on which fishing strategy is most profitable (Respondents 36 and 38). Those looking for short-term profits tend to fish without a licence and outside the ecological, moral and legal constraints imposed by CCAMLR members, national governments, licensed fishers and concerned citizens to quickly harvest stock (Appendix C). However, large trans-national and/or family-fishing enterprises understand that greater profits can be made by becoming global corporate businesses. Businesses like the Spanish Pescanova Group have developed long-term downstream investment and established food-processing companies. Given that these expanded enterprises require high capital investment, risk-minimisation strategies have been essential to their economic sustainability and the stability of their business actor-networks. Therefore, these companies have chosen to secure access to toothfish stocks and maintain consistent and biologically sustainable harvesting levels over the long-term (Respondent 12). They have also chosen to fish in a licensed and regulated environment to ensure ongoing access to the fisheries, and to secure political input into ensuring that the fishery they had rights to fish was sustainably managed.

At the same time, the different cost structures of operating under a licensed or unlicensed structure creates a relative disadvantage of accessing the fisheries for licensed fishers (high costs) when compared to the costs incurred by IUU operators. It also affects the success of CCAMLR and domestic conservation measures. Respondents 40 and 70 explain that the gap is particularly acute for high seas fisheries because many vessels involved in IUU activities are FOCs and are not required to comply with CCAMLR principles and conservation measures, and nor are government authorities able to force beneficiary owners and IUU fishers to comply with national laws or establish a genuine link between the flag State and the vessels they operate (see AAD 2005d; Gianni & Simpson 2005; LOSC 1982 Articles 19 and 94).³¹⁴ For example, legitimate fishers are required to purchase and install a cVMS unit worth approximately US\$3,000 to US\$5,000, with an operating cost estimated at around US\$400 to

³¹⁴ According to the FAO (2004b), the issue of the “genuine” link has a long history; it arose prior to the Geneva Convention on the High Seas, 1958. This issue is still causing problems today. In 2005, a State grants nationality to a vessel usually by means of registration and by authorising a vessel to fly its flag. A vessel flying two or more flags is regarded as having no nationality.

US\$1,000 per vessel per year (Kelleher 2002 in OECD 2004b). They are also required to carry onboard official observers that may cost up to US\$300 to US\$500 per day and cause additional down-time in fishing due to their observational activities.³¹⁵ The proliferation of government regulations and conservation measures results in perceived and real disadvantages for legitimate fishers, and if governments become too restrictive or expensive these fishers may resist or disregard them and fish illegally to maintain their livelihood.

Respondent 36 also questions the motivations of wealthy fishers (based mainly in developing States) that use the weaker political and economic conditions of developing States (like Mauritius) to hide and/or justify their fishing or trading activities by advocating that their actions assist less powerful communities in these countries by providing economic security. She argues that fishers are not democratic and although they currently advocate sustainable options for the toothfish fisheries, it is questionable whether they will act in the common good and their resolve may alter at any time if the political climate changes and profits can be increased by shifting focus. For Respondent 36, harvesting and trading toothfish is not a debate about an individual State's right to economic security because conserving the toothfish "is a completely separate issue" and State economies need to be based on sustainable industries. This position illustrates that fishers and States can successfully protect their self-interests by mobilising economic and social imperatives to validate their engagement in fishing activities regardless of the environmental consequences.

Notably, the performances of fishers, whether they operate legitimately or illegally, are very powerful actors in the *Patagonian Toothfish Network*. However, their enrolment in the actor-network remains precarious and the links and nodes they have formed in CCAMLR and State-led sub-networks need constant maintenance, work and the support of other links and nodes (Law 1999a). In particular, conflicts over IUU toothfish activities centre on their modes of action that take a number of forms. Firstly, fishers may choose to fish legitimately or illegally, or repeatedly re-flag their vessels to make it difficult for authorities to track their activities. They may also chose to enter national maritime waters without coastal State authorisation and operate illegally, or harvest straddling stocks on the high seas adjacent to national maritime waters and undermine coastal State conservation measures. In addition, fishers from non-complying CCAMLR States may conduct their operations in a manner that is not consistent with CCAMLR conservation measures; or those from non-Party CCAMLR States may fish on the high seas in the Convention Area in accordance with their rights under LOSC. Fishers may also harvest straddling stocks in the high seas adjacent to the Convention Area, thus avoiding the need to comply with CCAMLR conservation measures. Adding to these contested performances are the actions of FOC vessels that undermine that ability of

³¹⁵ Australian toothfish fishers at the May 2003 SouthMAC Meeting stated that Australian observers are costed at a 60:40 ratio between industry and government where an observer's cost is based on "user days" at approximately US\$412 per day at-sea and US\$264 per day on land (Australia 2003b).

CCAMLR to manage toothfish stocks, pose an unacceptable risk to the environment and safety standards at-sea, and allow rogue fishers to gain significant competitive advantages over licensed fishers and discharge their catches with impunity. Finally, fishers may trans-ship toothfish at-sea (and often outside the Convention Area) to avoid regulation and mask the identity and source of the catch and/or offload and trade IUU toothfish products.

7.4.2 Cooperation and competition between and among NGOs

NGOs, whether they are environmentally or industry focused, are also increasing their associations and connections in the *Patagonian Toothfish Network* to further their self-interests and gain political legitimacy. Their performances and networking illustrate a powerful transformation from traditional State-led management approaches towards more diverse and *bottom-up* multi-levelled decision-making and influence (see Cole 2003; Eckerberg & Joas 2004; O'Brien 2002). However, NGOs create disjunctures in the *NGO Sub-network* and *Patagonian Toothfish Network* when they operate differently to one another in terms of their philosophies, objectives, strategies, operational functions and outputs. These differences have led to suspicion between certain NGO groups and uncomfortable relationships have formed on occasion between them and other stakeholders (Respondents 25, 36, 41, 52, 67 and 69). For example, conflict has arisen between Greenpeace and WWF because they are not traditional partners, have different opinions and strategies, and employ different tactics to achieve their aims (Sections 6.3.3 and 6.3.4). For example, WWF campaigners negotiate directly with government officials and industry and are often willing to reach mutual positions to reach outcomes, whereas Greenpeace campaigners are more confrontational. In this respect, Respondent 25 questions whether some ENGOs have compromised their positions by working in collaboration with governments and/or industry. In addition, when some respondents advocate that their own groups speak for the general public (actor-networks that are largely hidden in the *Patagonian Toothfish Network*) they are vulnerable to criticisms of being ego-centric, self-interested and promoting their own political agendas. For example, if "community members wish to enter the debate then it is up to us [as an ENGO], to be their spokesperson" (Respondent 36). However, to presume that ENGOs alone represent the community is a "dangerous assumption" that disregards other knowledge and expertise that could be enrolled into the debate (Respondent 6). For example, although the INGOs COLTO and SARPC are clear about their self-interested aims to provide a voice for the legitimate fishers, and even though tensions may arise between them and other ENGOs, they arguably speak for those they seek to represent. Indeed, Respondent 11 sees the fishing industry as "a link in the chain [which] knows about everything" where the fishers are able to provide advice about toothfish stocks, fishing techniques and conservation measures.

Conversely, tensions emerge particularly in ENGO actor-networks with respect to the perception that certain ENGOs speak as the head-actor-network for other organisations.

For example, Respondent 25 states that ASOC has not compromised its position and has worked successfully in coalition with other ENGOs such as Greenpeace and WWF that may be “mortal enemies in the environmental community.” However, she claims that because ASOC holds the observer status at CCAMLR meetings, other ENGOs can only gain a voice at the meetings by working through ASOC with a common voice. For Respondent 25, this not only includes ENGOs working cooperatively with governments and/or industry, but also working cooperatively between themselves. She attributes TRAFFIC’s decision not to work directly with ASOC as being due “to the individual personalities involved and their desire to own the IUU fishing issue” (Respondent 25). However, TRAFFIC campaigners have worked informally with ASOC and do attend CCAMLR meetings as IUCN observers (Section 6.3.6). TRAFFIC’s increasing legitimacy and influence in toothfish management fora typifies the success of other ENGO and INGO groups in these arenas and the *Patagonian Toothfish Network* (for example: COLTO, MSC, NET and WWF). Their influence is challenging the status and authority of ASOC as a head-actor-network that has resulted in the reconfiguring of power dynamics within the NGO community.

Furthermore, Respondents 25, 36, 38, 41, 52 and 64 reflect upon the ways that ENGOs have changed their campaign strategies over the past decade, and that they have not only had the capacity to institute change but also the capacity for change when they have sought to maintain power. In the late-1970s and early-1980s, ENGOs were clear about their position to *protect* uncompromisingly the Antarctic and Southern Ocean ecosystems, and their successes in CCAMLR were directed through ASOC given its observer status at CCAMLR meetings (Section 6.3.2). For example, in the 1980s, ASOC campaigners contributed to the CCAMLR negotiations, successfully advanced the concept of the precautionary principle in the Convention on the Conservation of Antarctic Marine Living Resources, and helped to ensure effective implementation and application of the ecosystem as a whole approach to management by CCAMLR members. They also mobilised resources and the support of other actor-networks, and were influential in the problematising and dismantling of CRAMRA, negotiating the CBD and contributing to the development of the Madrid Protocol as a new OPP. For Respondents 25, 36 and 41, the directed and persistent lobbying by ASOC campaigners and other ENGOs, such as WWF and Greenpeace, ensured that IUU fishing was also problematised and remained at the top of the CCAMLR agenda.

During the 1990s, ENGOs reinvented themselves in an effort to increase their legitimacy, power and support and extend their actor-networks. They became more professional and conciliatory, and their campaigners produced a number of constructive papers, particularly on krill fishery dynamics. For Respondent 2, ENGOs now have a different role in the debate, strive for more balance between protection, conservation and rational use, are experts in their field and have found that by working collectively and with industry, they have been able to mobilise issues because they have become

more credible. Here, experts that include scientists and environmental lawyers are advanced as powerful actor-networks in ENGO actor-networks that hold the answers. Once again, knowledge is held triumphant over other forms of knowledge and nature and society.

Since 2000, the *NGO Sub-network* has become vast and NGO campaigners have accessed information and infiltrated certain activities with great efficiency; such as COLTO identifying suspected IUU vessels, fishers and traders, TRAFFIC and NET providing toothfish trade analyses and WWF analysing the role of FOCs. In particular, their focus has included debates that problematise aspects of economic and social sustainability. Here, actor-networks involved in the trade of toothfish products (for example: fishers, traders, restaurateurs, chefs and consumers) are being captured and enrolled in an expanding *Toothfish Market Sub-network*, and trade analysts are being advanced as powerful actor-networks that complement other powerful actor-networks (for example: scientists and policy makers). The problematisation of trade in toothfish products, the enrolment of actors in the *Toothfish Market Sub-network*, and the transformation of trade knowledge has enabled NGOs to extend their power and bring market issues that were once hidden in the actor-network to the attention of other actor-networks. These organisations have also increasingly mobilised consumer pressure for improved toothfish management by encouraging individuals to exert power at the local level to purchase legitimately caught toothfish products, force governments to act and fishers to change their fishing behaviours (Respondents 22 and 39). Overall, Respondent 69 considers that NGOs “have achieved a lot of good work, particularly when they have worked with governments and the legitimate fishing industry to identify areas of common interest, build trust and exchange information.” Points of difference do not undermine the value of working together on areas of common interest (Respondents 6, 12, 16 and 17). Industry can provide intelligence and information on a good faith basis and environmental groups can provide balance to conservation discussions and the industry’s viewpoints.

NGOs also contribute to international fora, industry-government councils and constructive debate in policy forms. Consider NGO involvement in for example CCAMLR, the MSC certification process or Australian toothfish management fora such as SouthMAC and CCF meetings. However, Respondent 66 warns that the involvement of NGOs in toothfish management fora can be counter-productive if they “do not have a good knowledge of the fisheries and understanding of the issues involved.” For Respondents 34, 40 and 48, although NGOs have presented a professional image, some campaigners have failed to undertake dialogue with CCAMLR members or ATCPs or have presented information that lacked intellectual rigour. In these cases, the power exerted by NGOs in international fora is diluted. Indeed, Respondent 11 argues that one current danger to effective toothfish management and conservation “comes from the environmentalists [who use] only basic and easily obtained information” to influence

public opinion. Nonetheless, the increasing power exerted by NGOs has been assisted by their ability to form partnerships and connect with each other and other actor-networks using sophisticated communication technologies such as email, the Internet and the media.

7.4.3 Varying capacity to mobilise communication technologies

NGOs act locally, nationally, regionally and globally. Except for SARPC, all the NGOs in the *NGO Sub-network* have embraced sophisticated *technologies of communication* to define themselves, stabilise their actor-networks, and act at a distance and transform power.³¹⁶ For example, they use the Internet to connect with hidden actor-networks across the globe and inform them about toothfish and Southern Ocean campaigns. Some Internet websites are very sophisticated and highly regarded by other actor-networks for the net they cast and the information they transform on the toothfish and IUU activities, whilst others contain emotive material that attracts criticism (Appendix G). ENGOs have also grown the sub-network by producing videos and hosting workshops, meetings and conferences to raise government, industry and community awareness about Southern Ocean conservation issues. This actor-network capture has successfully enrolled other actor-networks in NGO-led problematisations and OPPs, and has increased the power of these groups in the *NGO Sub-network* and wider *Patagonian Toothfish Network*.

The ability of INGOs to mobilise communication technologies has also attracted the attention of other actor-networks. For example, the COLTO Internet website has achieved measurable success in connecting with other actor-networks to disseminate information, and, since its inception in 2003, it has received over 140,000 hits globally (~ 150 hits per day) (see COLTO 2006). Adding to these achievements, the COLTO observer attending CCAMLR XXIII noted that his organisation has paid over 20 separate informants for information on IUU fishing activities under the *Wanted Campaign*, and amassed a significant quantity of information on fishing activities including company details, vessel movements and port shipments (CCAMLR XXIII 2004a §14.18). The Internet has been particularly powerful in the success of these outcomes because it has provided a global net to link hidden actor-networks with COLTO. This organisation has modified and displaced the information provided by these concealed actor-networks in a chain of translation that has included transferring inscriptions on its Internet website and passing data and knowledge to relevant authorities for use in apprehending IUU operators.

³¹⁶ Rose and Jones (2004: no page) describes the double dance of agency between human and nonhuman actor-networks. They point out that “humans seek to manage (or ‘marshal’) material agency in technologies”, for example to exploit *technologies of communication* to produce higher transmission rates over long distances, “while the technologies help simultaneously to shape human practices.”

Other *technologies of communication* such as art and literary works, telephones and various texts (including: letters, memos, emails, briefing papers) remain hidden, but influential actor-networks in the *Patagonian Toothfish Network*. Nonetheless, they are mobilised by all the various actor-networks to connect with one another and other actor-networks. For example, Respondent 25 states that one of the main tools she uses as an ASOC campaigner is fostering relations between members by talking to people on the telephone and using email correspondence. For her, these communications are crucial for building connections between people and negotiating difficult outcomes. The mobilisation of communication technologies, generally, highlights the difficulties associated with managing toothfish stocks are not just physical problems; they have an informational component which is socially constructed in a net of multiple struggles among contested knowledge claims (see Litfin 1998). Importantly, access to, and controls over, information are crucial and controversial elements of toothfish environmental decision-making, and equally important in the mobilisation of power by all actors in the actor-network.

Since 1997, the media actor-network has also become an increasingly influential in the *Patagonian Toothfish Network*. In particular, journalists have extended the actor-network and become agents of change through their ability to mobilise *technologies of communication* such as newspapers, television, radio and the Internet to publicise information (Section 6.4). The Patagonian toothfish initially became newsworthy because other more appealing actor-networks were mobilised into the *Patagonian Toothfish Network* and associated with the fish (such as albatross species being threatened by toothfish fishing activities). The toothfish has since mobilised its own publicity as it has connected with and enrolled more actors in the actor-network. In this regard, the media have become an increasingly important source of information on the toothfish and IUU fishing and are often in direct competition with State-led information because journalists are trained to work competitively in the marketplace and able to connect quickly with hidden actor-networks at a distance (Shell International Limited 2005).³¹⁷ For example, the Internet can instantly transfer information electronically to and from anywhere in the world.³¹⁸ Given the power of the media and the Internet, scientists, government officials, NGOs and fishers have connected with journalists via media releases and interviews to raise their profiles, disseminate information and maintain pressure upon those involved in, or supporting, IUU activities. Importantly, without the ability to connect with other actors in their own actor-networks, journalists (and the media) would lose their power.

³¹⁷ Newspaper articles include: Brown (2000; 2004); Darby (1997); Garran (1999); Gosling (2003; 2004a, b, c); Knowler (2005); Middendorf (2001); Perry (1998); *Quotidien* (1998); Salopek (2004); Schoonakker (2003); *The Australian* (1998); *The Bulletin* (2002); *The Mercury* (2005); Uhrenholdt (1998).

³¹⁸ Internet media reports include: *ABC NewsOnline* (2005a, b); *Canada News Wire* (2003); *Dispatch Online.com* (1998a, b; 2002); *Environmentalaction.net* (2004); *MercoPress.com* (2004a, b; 2005); *News24.com* (2002; 2003a, b); *RIA Novosti* (2005); *Scoop Media* (2003); *The New Zealand Herald.com* (2004); *The Sunday Times* (2003).

However, the extent to which the general public is enrolled in the *Patagonian Toothfish Network*, aware of the salient issues pertaining to the Southern Ocean or the toothfish, or able to mobilise its power to influence government policy, remains a moot point. Nonetheless, significant media publicity about the toothfish and the impacts of IUU fishing activities on these stocks has brought these issues to the communities' attention. Such development became evident with the British TV Earth Report *White Gold – The Pirate Menace* (TV-E 2000), which was broadcast to over 180 million people internationally on each of the two occasions it was aired (Respondent 24), and the highly acclaimed Australian documentary *The Toothfish Pirates* (Masters 2002).³¹⁹ In addition, toothfish IUU fishing activities are being increasingly reported in current affairs television reports in Australia and articles have been published in newspapers in many States (see, for example: ABC 2005a, b; ABC Radio 2005). Interestingly, only 28 per cent of respondents advocated that *technologies of communication* (including the media) be used to effectively communicate toothfish fisheries issues with all stakeholders including the general public. This is an important point because, without communication technologies, inscriptions and other material actor-networks creating OPPs for other actor-networks and mobilising information through chains of translation, the connections between the actor-networks might not be as extensive. In addition, the ability of the actor-network to capture additional actors and networks and/or mobilise power might be reduced.

Then again, caution is needed when reviewing the power of communication technologies and the information they transform in the *Patagonian Toothfish Network* regarding the toothfish and IUU activities because misinformation can be distributed by actor-networks who seek to push self-interested positions or canvas public support. For example, in 1996, Suidor Fishing Pty Ltd (a company affiliated with the Sealord Group Ltd) invested in the first Patagonian toothfish vessel licensed by the South African Government to fish in the newly established PEMI Patagonian toothfish fishery (Respondent 49). In this example, an African National Congress (ANC) media release reported that the company, on finding that IUU operators had exhausted the fishery, had cancelled its operations before its own fishers entered the area (ANC 1996). However, Respondent 49 refutes this media release and explains that the company fished for Patagonian toothfish for over six years before severing its ties with Sealord Group Ltd after disagreements about fishing for Orange roughy in Namibia. This discussion highlights how some fishers might manipulate the media for their own advantage and how misinformation, and in this case media reports and Internet sources, can be distributed and interpreted as fact.

³¹⁹ The British TV Earth Report exposed IUU toothfish fishing and attributed successful efforts to curb these activities directly to ISOFISH (Fallon & Kriwoken 2004; TCT 2000; TV-E 2000). The Australian documentary interviewed Alistair Graham (ISOFISH) and detailed IUU fishing efforts, particularly those allegedly by the trans-national Hong Kong fish trading corporation, Pacific Andes International Holdings and its Jakarta based subsidiary, Sun Hope Investments (Masters 2002).

Other actor-networks also present misinformation to maintain their positions underpinned by self-interest. As detailed, some CCAMLR members have been questioned for promoting *hot* science that was of dubious or questionable status and NGOs have been criticised, on occasion, for the lack of accuracy in some of the information and data they have circulated. One such criticism was raised against the reports published by ISOFISH on IUU fishing activities with regard to the identification of some *illegal* vessels, which were later verified as operating legitimately. At the June 2004 CCF Meeting in Australia, the South American office of Oceana (an ENGO based in Chile) was also criticised by other ENGOs (including Greenpeace, HSI and WWF), government officials and licensed fishers for not verifying that all the vessels publicised on its Internet vessel blacklist were, in fact, operating illegally (Australia 2004f; Respondent 12). These incidents highlight that the release of inaccurate or contentious information into the public domain not only harms the reputation of the fishing industry, but also the reputation of the *NGO Sub-network* and the work of CCAMLR members and national governments in their efforts to establish accurate information that can act as a powerful influence on others actor-networks.

7.5 Observations

Despite sustainability principles helping to construct the *Patagonian Toothfish Network* by squeezing the sustainability debate, they can also destabilise the actor-network. This is because sustainability principles are dynamic concepts that are subjectively interpreted and selectively applied by human actor-networks when they seek to exert power and maintain control over other actor-networks in their spheres of influence. As such, it is not possible to identify whether any of the toothfish fisheries are biologically sustainable, or the extent to which other dimensions of sustainability such as economic or social sustainability influence the actor-network. In particular, although human actor-networks hold scientific knowledge as supreme, and scientists have expanded understandings about the ecosystem and the toothfish, this knowledge has failed to eliminate risk, reduce uncertainty in the fisheries, stop over-fishing or IUU fishing and stabilise the actor-network. At best, scientists have minimised some risks for various sub-populations of toothfish, but the entire population remains the primary locus of risk.

This discussion highlights that the act of governing comprises managing at-risk actors and networks (including the toothfish or vulnerable and exploited fishers), high-risk actors and networks (including IUU operators and rogue flag, port and market States) and low-risk actors and networks (including complying CCAMLR States and responsible fishers). In addition, many spaces in the *Patagonian Toothfish Network* are inherently risky. For example, the dangerous and distant conditions imposed on fishers by the Southern Ocean ecosystem can place at risk their safety and/or life. Therefore, risk is an inevitable continuum in an actor-network that can never be dissipated, only minimised, localised or avoided by the choices made by individuals to modify their own behaviour and, in turn, monitor risk (see Dean 1999; Eckerberg & Joas 2004). However,

although there are actor-networks who seek to manage individual risks (including scientists, fishers and NGOs that advance sustainable fishing outcomes), there are other actor-networks that challenge moral and social norms when they comprise disadvantaged actors and networks – such as the Patagonian toothfish – that are at risk and less capable of self-management. This species does not *choose* to become hooked onto longlines or caught in trawl nets and it is harvested regardless of whether its numbers are ecologically unviable. In this respect, there are no mechanisms in which the Patagonian toothfish can be contracted by those who seek to manage and conserve its numbers and this key actor-network is only ever partially enrolled in the *Patagonian Toothfish Network*.

In this light, many respondents remain frustrated about the capacity of vision-driven actor-networks such as Agenda 21, and other international actor-networks such as the Convention on the Conservation of Antarctic Marine Living Resources, ATS, LOSC or the UN Fish Stocks Agreement, to manage and conserve the toothfish fisheries effectively. The concerns of respondents illustrate that actor-networks in the *Patagonian Toothfish Network* accept the OPP established in this investigation in that they all want the toothfish to multiply. They also accept that it may not be possible to manage toothfish stocks sustainably if they are over-fished or IUU fishing continues unabated (Section 2.4.2). In particular, respondents are critical about the capacity and commitment of CCAMLR members and national governments to connect collectively with those who continue to disregard the principles and measures embodied by these international regimes. Fundamental weaknesses and loopholes in these instruments create disjunctures between the actor-networks, possibly because actors within them do not wish to leave themselves open to criticism or to destabilise their own capacity to exert power in their actor-networks of influence. Therefore, although CCAMLR strives for head-actor-network status in the *CCAMLR Sub-network*, it never fully silences all CCAMLR members, nor does it speak for those protecting their national or commercial interests or IUU operators. Consequently, the *CCAMLR Sub-network* is not a black-box, it remains precarious and CCAMLR is never truly an ultimate head-actor-network within this actor-network or the wider *Patagonian Toothfish Network*.

As Latour (1986; 1992; 1993; 1998c; 2004) proposes, nature and society are symmetrically held together by active sets of relations that weave through the actor-network and continuously exchange properties. Therefore, nature is not an objective entity that obeys its own laws and nor can scientists or government officials claim privileged authority. Nonetheless, divergences do occur between ecologically, scientifically and politically defined spaces and certain actor-networks advance their own interests at the expense of others. For example, some scientists and government officials have forced national interests at the expense of global equity considerations, the ecosystem and the Patagonian toothfish; some fishers have exploited the toothfish fisheries; and some NGOs campaigners have supported uncompromising campaign

strategies. Conversely, many scientists perform with integrity and promote objective science, officials cooperate with one another to affect change, and licensed fishers and NGO campaigners contribute constructively in policy debates. Therefore, the performances of the actor-networks and the power they exert in the *Patagonian Toothfish Network* remains contested and contingent upon the associations they mobilise.

Chapter 8

Actions to Manage the Toothfish

8.1 Introduction

This chapter describes how state and non-state actor-networks seek to mobilise power to influence other actor-networks in the *Patagonian Toothfish Network*. It introduces four principal strategies and a range of management-based actions for managing and conserving toothfish stocks advanced by the respondents, and possible solutions for stopping IUU fishing that have been reconstructed using the tools of analysis from the key informant data and participant observations (Figure 8.1).

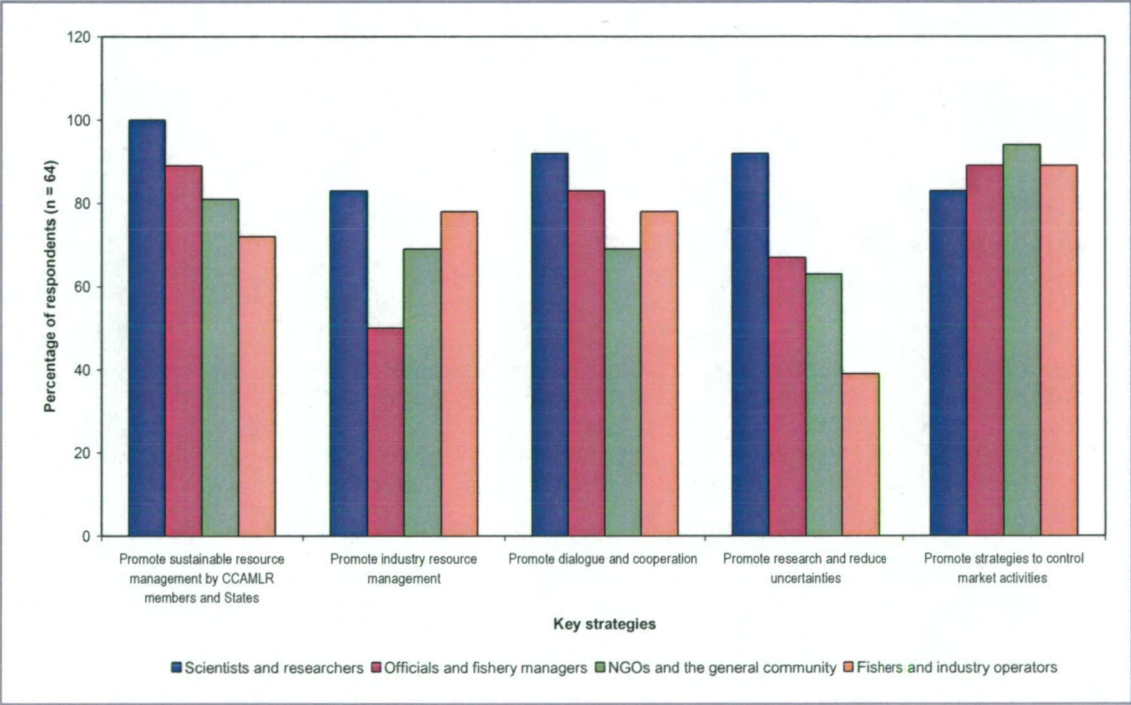


Figure 8.1: Strategies to advance sustainable toothfish fisheries (n = 64)

Reducing the data to a limited number of strategies and actions allows interactions to be translated (transported) out of their original spatial and cultural settings into a manageable and stable form that embodies this inscription (immutable mobile), which is then translated to sub-networks within the actor-network. This approach is subjective because the decisions I made on what to include in the text inevitably places certain emphasis on the data. A complex array of outcomes for the toothfish fisheries are revealed, a number of which are put forward by actor-networks that are sometimes hidden, overlooked, dissident or discredited by other actor-networks who exert greater power (see Callon 1987; Foucault 1986; 1991; Latour 1987; 2004). By disengaging with certain convergences or divergences in opinion, it becomes difficult for more powerful actor-networks to assess why and how issues emerge. It also becomes difficult or more

powerful actor-networks or to develop mechanisms that are supported by other actor-networks to adequately address problems or promote desired outcomes.

Figure 8.2 illustrates 20 reconstructed management-based actions to achieve the principal strategies, stop IUU activities and advance sustainable toothfish fisheries. Notably, promoting co-management for the fisheries is visibly supported by respondents as an action to achieve sustainable outcomes for the toothfish. Implementing effective market controls and trade certification are also revealed as key actions and they are described in Chapter 9. In addition, actions such as implementing effective flag and port State controls and increasing surveillance and enforcement activities are shown as important actions to stop IUU activities. Improving procedures and technologies to reduce bycatch and/or environmental damage, and fostering cooperation between stakeholders to achieve shared outcomes are also exposed.

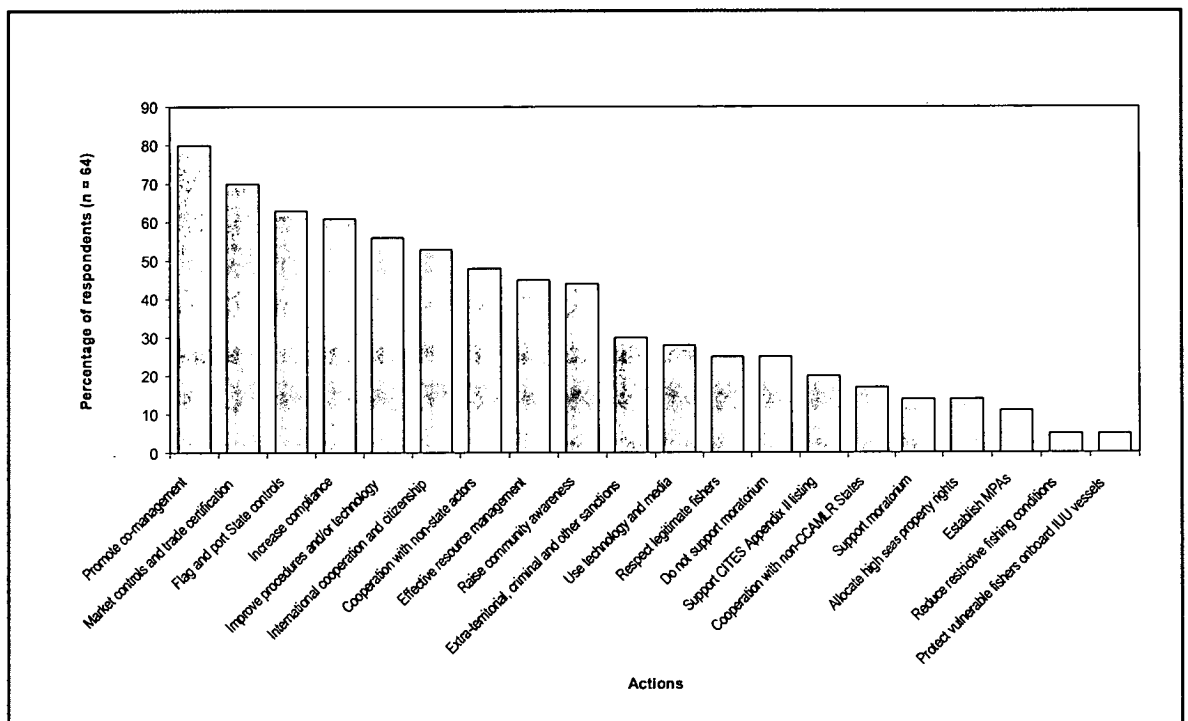
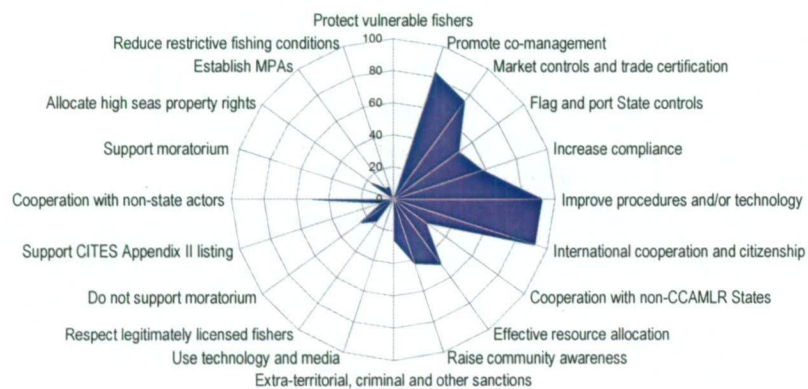


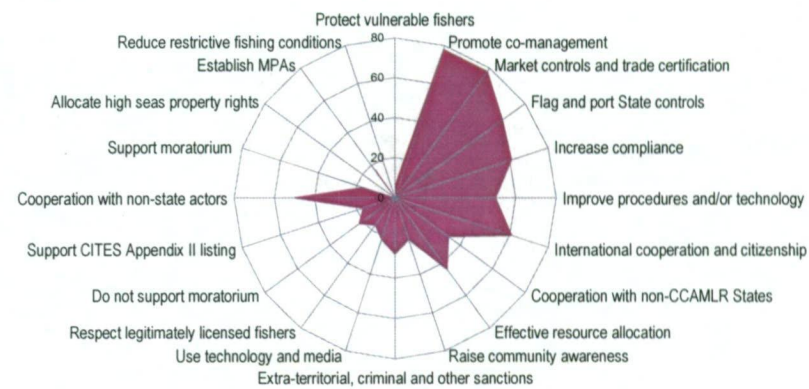
Figure 8.2: Actions to advance sustainable toothfish fisheries (n = 64)

Figures 8.3 and 8.4 present a series of radar graphs and radar graph overlays that unpack the reconstructed management-based actions into the four key actor-network categories (Sections 2.3.3 and 5.3.1). Government officials and fishery managers consider the greatest range of actions, although all the actions reflect each respondent's particular political stance or self-interest. Notably, the overlays reveal dissident views and hidden actions that deepen the analysis (see Patton 1990; 2001) (Appendix B).

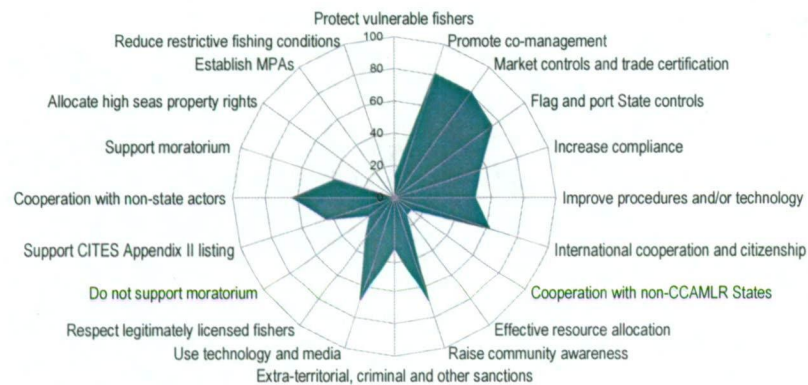
Scientists and researchers (n = 12)



Officials and fishery managers (n = 18)



NGOs and the general community (n = 16)



Fishers and industry operators (n = 18)

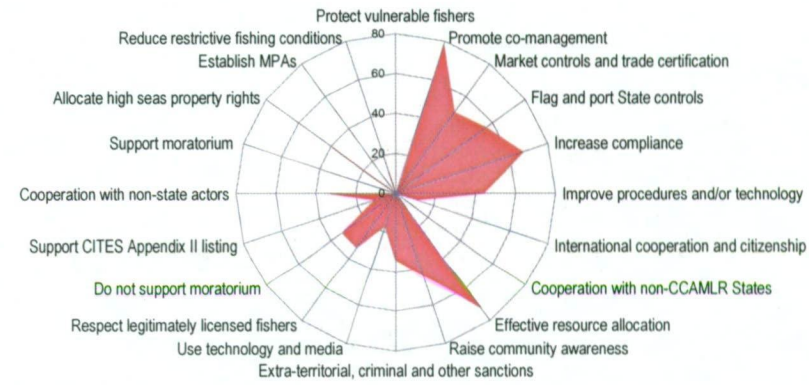


Figure 8.3: Actions to advance a sustainable fishery for each actor-network category (percentage of respondents per actor-network category)

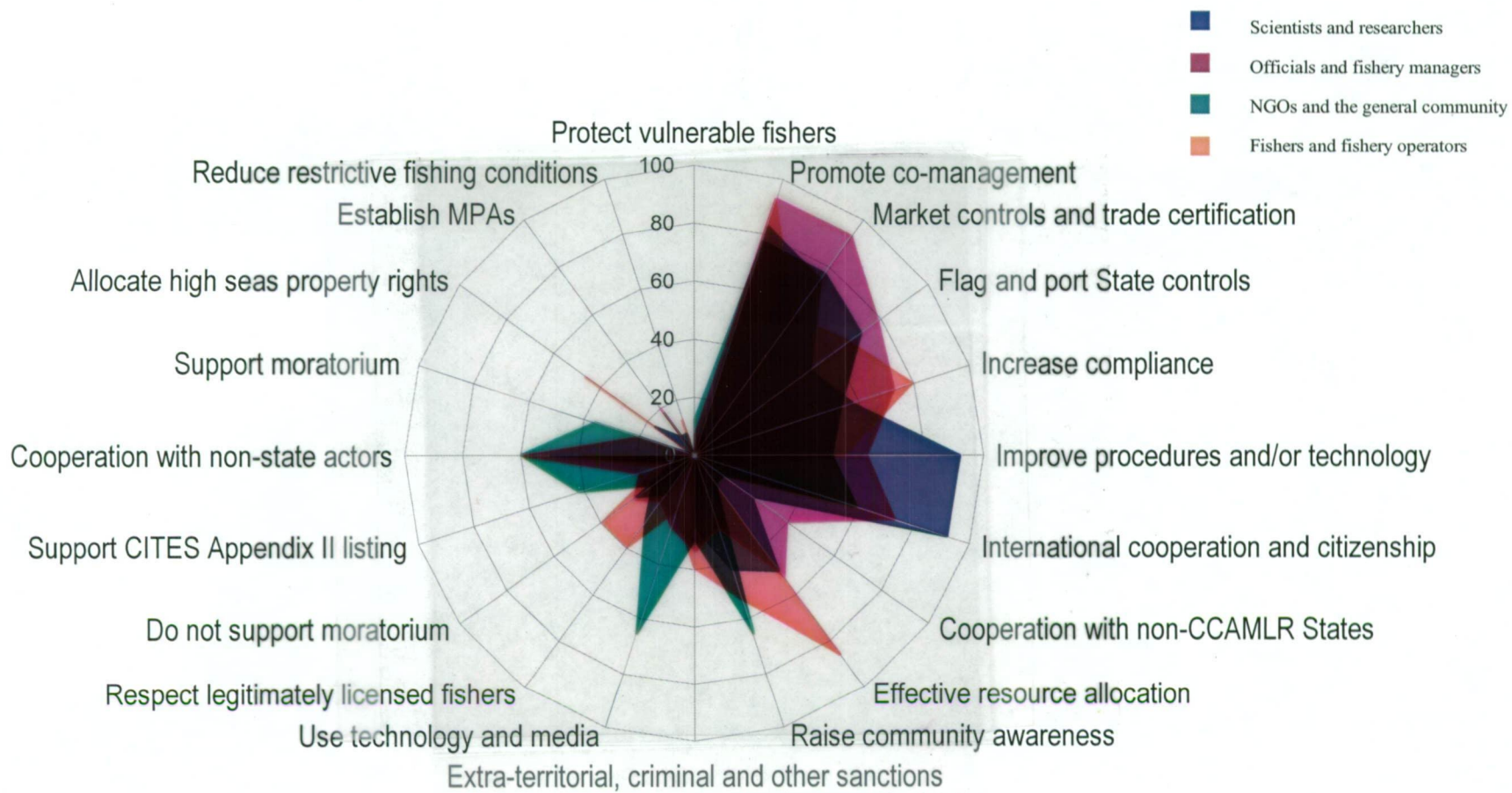


Figure 8.4: Overlays of the actions to advance a sustainable fishery for each actor-network category (percentage of respondents per actor-network category)

For example, fishers and industry operators differ from the other respondents when they support high seas access rights or are silent on promoting international cooperation between stakeholders or fostering cooperation with States not party to CCAMLR. Along with scientists and researchers, they are also largely silent on the use of technology and media to communicate effectively with other or more powerful actor-networks. Notably, many respondents are silent on actions to protect vulnerable fishers onboard IUU vessels, reduce restrictive fishing licence or conservation conditions, and establish MPAs.

8.2 Promoting sustainable resource management by state actor-networks

This section focuses on the first principal strategy where respondents call for state actor-networks to promote sustainable resource management at the international level for managing the toothfish fisheries. Overall, 84 per cent of respondents back this strategy across all actor-network categories and they propose a range of actions to achieve this end. The unanimous support for this strategy from scientists and researchers suggests that the actor-networks likely to hold scientific understandings for providing the answers for effective international resource management are those who back this approach most strongly (Figure 8.1). Nonetheless, actions put forward by respondents include those centred on achieving effective international fisheries management such as fostering international cooperation and citizenship, supporting global oceans governance, equitably and efficiently allocating toothfish resources and cooperatively managing straddling stocks that cross jurisdictional borders. Respondents also support punitive actions to regulate fishing activities and propose that effective compliance and international sanctions are paramount to ensuring that toothfish industry operators conduct their activities responsibly.

8.2.1 International fisheries management

To achieve effective resource management at the international level for the toothfish fisheries, over 50 per cent of respondents recommend that stakeholders foster international cooperation and citizenship for collectively managing the toothfish fisheries (Figures 8.2, 8.3 and 8.4). In this respect, 92 per cent of scientists and researchers but only 11 per cent of fishers and industry operators support this action. In addition, 17 per cent of respondents propose that fostering cooperation with non-complying and non-Contracting CCAMLR Parties that seek to access the fisheries but also seek to remain independent from the CCAMLR collective is important to promote sustainable fishing practises globally and elicit compliance (Figures 8.2, 8.3 and 8.4). No fishers or industry operators comment on this action. These outcomes imply that scientists and researchers may focus more on outcomes directed to the common good whereas fishers and industry operators seek to protect their commercial interests.

For Respondent 28, fostering international cooperation and citizenship can only be attained by taking a major step forward in global oceans governance (or a World Government). Global ocean governance is the development of a mosaic of ocean rules and practices that extend the precise domain of regimes (Cole 2003; Friedheim 1999; Stokke 1999).³²⁰ It also aims to equitably allocate ocean uses and resources (including the notions of sustainability), and provides the means of resolving conflicts over access to, and the enjoyment of, the oceans benefits. States provide the structural component to global oceans governance because they recognise, legitimise and encourage trans-national citizen and corporate interaction through the creation and implementation of national laws (Stokke 1997; Wapner 2000). However, global oceans governance also encompasses non-state actor-networks of various kinds, working within or across State boundaries. Given the diverse range of actor-networks potentially involved with global oceans governance, cooperation is the framework within which these actor-networks need to balance individual and national rights and individual and collective obligations within and beyond the State through social relations (Dzidzornu 2002; Lipschutz 1997).

The call for global oceans governance by some actor-networks for managing and conserving the toothfish fisheries has emerged in response to over-fishing and the ecological, moral and legal challenges to fisheries management that IUU fishing makes visible. Here, the connectedness between actor-networks is promoted through trans-national social webs of alliances and increasing knowledge about the fisheries. For example, Respondent 28 supports global oceans governance to promote multilateral cooperation and action, despite national governments and CCAMLR guarding their sovereign territory or spheres of influence. However, he also contends that the lack of a universally accepted and comprehensive corpus of international law and rule adjudication at the international level reduce the potential success of global oceans governance. As a result, it is often necessary for States to resort to political settlement to solve disputes with regard to the toothfish fisheries rather than embracing universally accepted ecosystem management. As one solution, Respondent 62 recommends the establishment of a Global Fisheries Management Organisation (GFMO) to connect RFMO actor-networks, promote the global integration and harmonisation of RFMO arrangements and avoid duplication, overlap and weaknesses between the instruments (see AAD 2005d; Friedheim 1999; Miller *et al.* 2004; Molenaar 2004).³²¹ However, Respondents 44 and 65 remain hesitant about creating a GFMO because they consider it would add another organisational layer to an already complex and cumbersome international management structure. In addition, Molenaar (2004: 229) points out that given “the considerable time that is likely to be involved in negotiating such a treaty”, it

³²⁰ Global governance is bringing more orderly and reliable responses to social and political issues that go beyond the capacities of States to address individually (Gordenker & Weiss 1996).

³²¹ To advance global oceans governance arrangements and the effective operation of regimes generally, Stokke (1999: 171-172) recommends *diffusing* formulas or solutions (such as globally recognising the precautionary principle) from one regime to another; *validating* and *uniting* certain rules or institutions to broader normative principles and rules of right process; and the *programmatic injection* of scientific or technical activities conducted within one regime to the operation of another.

should not have the international community's priority, and "other global, regional or unilateral approaches" that are likely to have more beneficial short-term outcomes ought to be pursued. Respondent 49 also acknowledges the need for CCAMLR to complement other IGOs but uses the word *complement* rather than *contribute to* because it implies a two-way direction of input. He states that CCAMLR and its members need to foster dialogue with the members of other regimes, but is opposed to having CCAMLR's competencies compromised by them.³²² Again, this point highlights that CCAMLR and its members resist conceding authority to other IGOs.

However, RFMO actor-networks need to develop linkages because management arrangements for different marine species and areas may overlap; and each RFMO has different objectives (such as stock conservation versus optimal utilisation), standards (such as vessel registers, black/white vessel lists or VMS requirements) and governance arrangements (such as consensus decision-making or other approaches) (see Stokke and Vidas 2004). States also have different political interests in the RFMOs of which they are members. In addition, the geographical location of RFMOs and a States' culture, knowledge, experience and capacity to act may influence decision-making. For example, developing States may not have knowledge and experience in an issue or the capacity to address it, and due to these factors their decision-making processes may be influenced by other more powerful States.

With these issues in mind, participants in the 2003 *Workshop on the Governance of High Seas Biodiversity Conservation*, held in Cairns, Australia, focused on establishing effective global oceans governance arrangements (NOO 2003). They highlighted the need for the UN to reduce gaps in international governance arrangements that impede conservation of biodiversity of the high seas and deep oceans including the need to establish new RFMOs for exclusively high seas stocks and develop a *Global Oceans Policy*. Other recommendations focused on managing the high seas within the framework of LOSC and from a global perspective including improving national, regional and global coordination, advancing cooperation and awareness-raising mechanisms; developing capacity-building for developing States; increasing scientific and governance research; and urgently addressing the problems of FOCs and the primacy of flag State jurisdiction on the high seas. In addition, participants identified that developing bilateral and multilateral agreements between like-minded States are necessary to stop IUU fishing and important mechanisms to implement environmental and sustainability obligations of LOSC. The final report of the OECD *Ministerially-led High Seas Task Force on IUU Fishing* also identifies the need for better high seas governance and capacity-building that includes encouraging States to become parties to relevant international instruments, developing a model to improve RFMO performance and promoting the concept of responsible port States (HSTF 2006).

³²² For example, when SEAFO is fully functional, information will be passed between this organisation and CCAMLR because they share adjoining boundaries (Respondent 49).

Many respondents also support the development of bilateral and multilateral agreements including the Treaty between Australia and France recently developed jointly to protect maritime areas adjacent to the TAAF maritime zones of the Kerguelén and Crozet Islands, Saint-Paul Island and Amsterdam Island, and the Australian HIMI maritime zone (Australia 2003a; Respondents 36, 49, 51, 57, 58 and 70). The Treaty has not yet entered into force, although it provides for bilateral and cooperative surveillance operations by Australian and French authorities of vessels that appear to be in breach of either national or international fisheries law (see Australia 2003a). In addition, Australia and France intend to conduct cooperative scientific marine research; exchange information and intelligence on the location, movement and licensing of fishing vessels; and combine logistical support for each State's *hot pursuit* of suspected IUU vessels. Given the success of this Treaty, Respondent 49 states that it is now going to be formalised three ways between Australia, France and South Africa, following the success of South African and French joint patrol efforts using French assets to patrol South African waters around the PEMI.³²³ Nonetheless, Respondent 70 identifies that negotiating bilateral and multilateral agreements can take years. In this regard, the Australian and French Governments are "leaving the Treaty [between Australia and France] behind because the cooperative effort between the two countries is already far greater" than what the agreement advocates, although its "detractive effect" appears to be contributing to a reduction in IUU fishing activities in the region since it was signed (Respondent 70). Consequently, some respondents consider that cooperation treaties are useful because it is unrealistic to assume that a few individual States have the resources to manage the toothfish fisheries or combat IUU fishing single-handed. This discussion also illustrates that treaties and other international arrangements can lose their authority and become rapidly outdated, whereas progressive negotiations can potentially change the behaviour of others in an incremental and ongoing way.

Alternatively, 39 per cent of fishers and industry operators maintain that effective management of high seas toothfish fisheries can only be achieved if CCAMLR members allocate high seas access rights so that licensed fishers can protect the stocks they have claim over (Figures 8.3 and 8.4). For Respondent 17, the allocation of high seas access rights needs to be based on the legal catch history of each State; a reward system for those States able to prove previous sustainable management practices; and effective enforcement of domestic legislation and CCAMLR conservation measures. Therefore, once allocations are made, it appears that some licensed fishers seek a higher than currently accepted level of independence from the surveillance and monitoring functions of CCAMLR. As an illustration of this compound tension between scientific understandings of limits, precaution and uncertainty and commercial understandings of maximal effort, private property and commercial-in-confidence rights, it is useful to

³²³ Respondent 49 also refers to the success of the informal alliance of like-minded coastal States in the Indian Ocean that formed in 1996 within CCAMLR known as the *Eastern Antarctic Coastal States Alliance*. Comprised of Australia, France, South Africa, Norway and New Zealand, the alliance achieved measurable success when gathering intelligence and establishing joint observer agreements.

note that licensed fishers do not comment on the inability of LOSC to allocate fishery access rights to individual fishing companies. This is because the allocation of high seas access rights to individual fishing companies would compromise the fundamental principle of all States having the right for their nationals to fish on the high seas (LOSC 1982, Article 116). However, one licensed fisher states that given every State's right to fish on the high seas, "there's nothing to prevent each country having a share of the global TAC for that year, and then allocating that share to particular companies for that year" (Respondent 12).³²⁴ Nonetheless, his views illustrate how fishers are actively expanding their understandings of international oceans governance arrangements in an effort to protect their commercial interests. However, questions remain about allocating common resources to a small number of wealthy and powerful licensed fishers and their resolve to act for the common good when harvesting these resources (Section 7.4.1).

Participation model

The need to implement effective resource allocation is advanced by 45 per cent of respondents. Although approximately half the scientists, researchers, officials and fishery manager respondents support this action, 72 per cent of fishers and industry operators consider it paramount but only 13 per cent of NGO representatives deem it significant. This outcome illustrates that the fishing industry strives to maintain access to the fisheries and control over the resource they seek to own, whereas NGOs support more protectionist measures. As one mechanism to implement effective resource management, some scientists consider the merits of implementing a participation model to manage toothfish stocks (Respondents 2, 26, 34 and 68). The model seeks to limit participation (the number of vessels) in the toothfish fisheries rather than property rights and it may be one means to achieve this better allocation (see Davies & Constable 2003).³²⁵ It works on the introduction of Minimum Catch Units (MCUs) per vessel to reduce fishing effort. For Respondent 49, this type of model "is the way forward" because including all stakeholders and the best information is "crucial for decision-making and capacity-building." Although these measures are not the same as high seas access rights, they aim to control fishing activities (see also Friedheim 1999).³²⁶

However, one licensed fisher's response to a participation model is that it is "quaint and unworkable ... In the real world, allocation rights are the way forward to managing resources, along with compliance and surveillance, ... because when fishers own a resource, they have a vested interest in managing, maintaining and conserving that

³²⁴ An allocation system might be similar to that one imposed on the Australian Southern bluefin tuna (*Thunnus maccoyii*) fishery (see AFMA 2005h). The CCSBT sets a global TAC and determines national catch limits, the Australian Government then grants SFRs as a proportion of the TAC (AFMA 2004b).

³²⁵ Australian scientists presented the participation model to the Australian CCF in 2003 (Australia 2003c). They debated controlling participation in the toothfish fisheries (by introducing MCUs per vessel to reduce vessel numbers) rather than allocating property rights (see Davies & Constable 2003).

³²⁶ From an Australian viewpoint, fishery managers are seeking expressions of interest from fishers to fish on the high seas consistent with CCAMLR in terms of fishing season, number of vessels and TACs.

resource” (Respondent 10). His own company owns a significant proportion of a coastal State’s Patagonian toothfish resource and is both “committed to managing and protecting this resource [and willing to] commit millions of dollars achieving this” (Respondent 10). In addition, licensed fishers advocate that it is not the number of vessels in a fishery that is important, but the impacts that are caused by each fishing vessel. A number of fishery managers also voice some reservations about applying a participation model to fisheries. For example, Respondent 70 suggests this model may only be suitable where there are a limited number of States accessing a fishery. However, it may not be suitable for CCAMLR fisheries with multi-fleet activity, nor may it be possible to cap the number of participants in a fishery under LOSC considering that all fishers have a legal right to fish high sea resources. Given the opposition to the participation model by fishers, it remains uncertain whether they would support the introduction of MCUs per vessel or if they would exert power in the *Patagonian Toothfish Network* to ensure that governments adopted a different management approach. Alternatively, fishers might choose to act in a dissident manner and fish illegally.

Shared fishery model

Scientists also consider the merits of implementing a shared fishery model to manage trans-boundary toothfish stocks. For example, the management of shared fish resources is one of the “great challenges on the way towards achieving long-term sustainable fisheries” (Miller & Munro 2002: 29); “it is dangerous, if not foolhardy, to assume that non-cooperative management of shared fishery resources will suffice” (Munro *et al.* 2004: 62); and “international fisheries will not be effectively managed unless stable cooperative resource management arrangements are in place” (Miller & Munro 2004: 368).³²⁷ Respondents 31 and 37 also acknowledge the multiplicity of fishery agencies such that the uncoordinated management systems and regulations applied to the toothfish fisheries is a fertile ground for inefficiencies in economic, social and biological terms. Despite the political tensions between the Chilean, Argentine and British Governments over maritime territories in the Southern Cone area, they recommend managing the high seas fisheries from an ecosystem perspective that takes account of fish stocks or Fish Stock Units (FSUs) that are shared by more than one stakeholder over time (i.e. by a State or fishing fleet) (Section 4.4.2). For them, this approach may be useful for managing straddling Patagonian toothfish stocks including those located in Chilean, Argentinean and British maritime zones, or stocks located in Australian and French maritime zones, and those located in the Convention Area.

In the shared fishery model, the stock is simultaneously exploited (in one fishing season) by small-scale fleets in national maritime waters and large-scale international

³²⁷ For these commentators, implementing shared rights-based management schemes could dissipate resource rents and management costs, and increase side payments where mutually beneficial trades between private resource owners across borders might result in better environmental outcomes.

fleets in CCAMLR managed waters. Patagonian toothfish fishing activity (or multi-fleet activity) in national maritime waters and the Convention Area would be based upon one FSU that was treated as one fishery and subject to one fishery management system (namely CCAMLR). Respondents 31 and 37 recognise the difficulty of adopting such an approach and suggest that a shared fishery model could be operated through a combination of management instruments such as allocating individual or common fishing rights (i.e. ITQs or SFRs) to stakeholders, combined with appropriate aggregated TACs and mechanisms to avoid inefficiencies such as over-capacity and IUU fishing. If correctly implemented, the shared fishery model may also generate appropriate incentives for fishers to comply with regulations and compliance efforts.

For Respondents 31 and 37, the implementation of this type of management system needs to give due consideration to several issues including the potential negative effects an optimal allocation of harvest rates over time and geographical space or location (based upon fish stock dynamics and long-term economic factors) may have on different stakeholders or fishery operators. Issues of social equity are important in government and scientific actor-networks because, for example, fishery managers and scientists have debated if an optimal allocation strategy of harvest rates for a straddling Patagonian toothfish fishery indicates that fishing should only be directed to a number of year classes that may only be present inside one State's maritime waters. Under present national and international jurisdiction, this decision may have a negative impact on another State's national fishery because its fleet may not be able to harvest the recommended year classes. Therefore, Respondents 31 and 37 contend that use rights (individual or common quotas) need to be allocated to all relevant operators. However, these quotas need to be accompanied with licenses or permits for all relevant stakeholders to harvest their allocated portion of the fish stock inside the designated fishing area.

Although a useful action, this model may not initially be accepted by those States seeking to protect their national interests.³²⁸ If such a system were implemented, CCAMLR members and national governments would need substantial knowledge and research on fish stock dynamics. They would also need clear scientific and political justification for decision-making, adequate monitoring of the fisheries and effective compliance to ensure that geographical areas of influence, fishery units and a single fisheries management system approach were successfully identified and managed. Fishers under different State jurisdictions would also need to commit to agreed management and implement complementary fishing practises to ensure industry equity

³²⁸ Although States have traditionally been considered as the only relevant actor-networks in global politics because they were able to exercise exclusive State authority within territorial boundaries, this notion is no longer adequate to protect marine resources (see Darby 1994; Dodds 2000; Kaimieniecki & Scully Granzeier 1998; Kuehls 1998; Litfin 1998; Wapner 2000). States increasingly need to cooperate with one another (and CCAMLR and its members) and surrender some part of their sovereignty, political freedom and national power in an effort to manage trans-boundary Patagonian toothfish stocks.

and consistent environmental outcomes. These challenges may prove difficult as illustrated by the variable reductions in seabird bycatch in the Convention Area. For example, in the Patagonian toothfish fisheries found across the Kerguelén Plateau, the SC-CCAMLR noted that the overall estimated potential seabird bycatch in the French fisheries was over 4,600 seabirds, whereas a total of 13 seabirds were taken in the HIMI trawl fishery by Australian fishers in the 2004/05 fishing season (CCAMLR 2005d, f; Australia 2005e) (Section 7.2.5).³²⁹

Nonetheless, government officials and fishery managers recommend that CCAMLR members act as a group rather than as a collection of individuals operating under CCAMLR. For example, Respondent 53 suggests that collective management ought to be extended with the establishment of an inter-governmental commission to promote sustainable toothfish management that includes the harmonisation of the conservation measures between the Parties. He also refers to the issue of sovereignty conflict between Chile, Argentina, and the Falkland Islands/South Georgia and identifies that this conflict is contrary to implementing an ecosystem management approach. Initially, he recommends that the Chilean Government develop and apply an effective management system to control the artisanal fisheries in the Chilean maritime zone, which includes reducing the small-scale national fleet by 50 per cent, implementing a CDS for all catch and a VMS for every artisanal vessel. In relation to the high seas stocks, he acknowledges that the Chilean toothfish stocks “seem to be connected with the Argentine population” and that using both longliners and trawlers to harvest the catch in this extended region can result in the indiscriminate catch of an unusual proportion of juvenile or immature fish, which in turn affects recruitment into the fishery.

8.2.2 Compliance

Surveillance and enforcement

In an effort to stop IUU activities allegedly conducted by fishers from CCAMLR member States (or those whose vessels fly FOCs) and to interrupt their connections in the *Patagonian Toothfish Network*, 61 per cent of respondents support more effective surveillance and enforcement controls on IUU operators that do not comply with CCAMLR conservation measures or national laws (Figures 8.3 and 8.4). For example, Respondent 47 suggests that “the adoption and compliance of rules minimising the effect/disturbance of [toothfish] fishing on the environment is a key issue.” More specifically, some respondents propose that CCAMLR be provided with greater disciplinary authority and surveillance and enforcement capabilities so that CCAMLR members engaged in illegal and unreported activities are subject to measurable punishment such as the suspension of fishing permits (ACS 2003; Australia 2003b;

³²⁹ No seabird interactions were recorded for the HIMI longline fishery during the 2004/05 fishing season.

Campbell 2004; Ellison & Macdonald 2004). This initiative is supported by some NGO groups (see NET 2004c).

Although increased surveillance and enforcement measures may require significant resources, licensed fishers consider that the value of the fishery warrants such an approach and are willing to meet these costs if guaranteed access rights to the resources. Some licensed fishers support the surveillance efforts of their industry and claim that if they were removed from the fisheries, illegal operators would exploit the unmonitored resources and kill thousands more seabirds or bycatch species than do members of properly regulated and managed fisheries (Respondents 1, 6 and 12). They reason that licensed fishers may be the only presence in the remote toothfish fishing grounds able to monitor and provide information to governments on IUU fishing activities, since it is difficult and expensive for government authorities to conduct compliance activities in these areas. However, this discussion highlights that certain influential fishers ask other actor-networks to give them the power to protect the fisheries and maximise the opportunities for all actor-networks. This is a contentious outcome given that fishers seek to protect their commercial interests.

Nonetheless, Respondent 27 states “the fishers themselves are ... in a position to be able to monitor each other’s catch ... In the different fishing grounds in the Southern Ocean ... they [are] able to provide information of whether catch information provided [by other fishers is] potentially incorrect.” Respondent 11 also points out that if economic activity ceased in the remote fisheries, “navy patrol vessels could be [redeployed] to other missions, with the risk of further opening the fisheries to IUU [fishing] activities.” However, States are unlikely to reduce licence conditions or hand over enforcement activities to industry operators (Respondents 29 and 70). Under LOSC, only government vessels are able to carry the immunity of an enforcement role in terms of boarding and inspection. This situation presents a conflict of interest issue for States because they may not be able to remain independent from industry if potentially subjective accounts from industry are taken into consideration. Therefore, although fishers have an important surveillance and intelligence role in controlling the toothfish fisheries, their role in enforcement and compliance efforts is problematic. For Respondent 29, carrying customs and/or fishery officers onboard fishing vessels may provide a solution to legitimately using industry to assist in government patrol operations.

Some respondents advocate that the only effective way to regulate fishing activities is by conducting vessel inspections (as part of the observer scheme). For example, Respondent 2 refers to the scheme but argues that of the few inspections that have been completed, nearly all have been conducted by United Kingdom authorities in SGSSI waters. Respondent 49 also identifies that the number of inspections conducted by CCAMLR members is relatively low and the scheme could be extended as an effective deterrent against IUU fishing activities. However, he warns that controlling vessels

flagged to States with weak national laws or States not party to the Convention on the Conservation of Antarctic Marine Living Resources using inspection provisions alone is problematic and a *toolbox* of interconnected measures is needed to manage the toothfish fisheries. Nonetheless, Respondent 49 supports at-sea vessel inspections (including the inspection of mother ships and trans-shipment vessels) to ensure that toothfish catches are not illegally laundered and to add to information that has already been complied from port inspections (see Gianni & Simpson 2005; Miller *et al.* 2004).

Some respondents acknowledge that the significant resources needed to conduct surveillance and enforcement operations are often too high in financial cost for individual States to sustain (Figures 5.7 and 5.8). Consequently, they recommend that like-minded CCAMLR members collaboratively fund vessels to patrol the Convention Area and, particularly, more distant high-Antarctic waters south of 60°S. For them, collaboration between CCAMLR members is important because they have the collective authority to apply diplomatic pressure on those States and fishers who flaunt international obligations and national fisheries laws (Respondents 27, 29, 34, 40 and 49). In this vein, the final report of the OECD *Ministerially-led High Seas Task Force on IUU Fishing* also identifies the need for promoting cooperative surveillance and enforcement efforts such as strengthening the *International MCS Network*, and other punitive measures such as exposing IUU operators, making IUU operations less profitable and controlling the import of IUU products (HSTF 2006). At the same time, the report warns about the over-reliance on sophisticated satellite-based tracking systems and other detection technologies to monitor fishing activities because they can be incorrectly interpreted, tampered with or manipulated. In addition, Macdonald (2004a), stated at the 2004 *Annual Conference of the Maritime Law Association of Australia and New Zealand*, held in Adelaide, Australia, that better international forms of evidence are needed to accord with updated surveillance and identification techniques, and the rules regarding international bonding of vessels suspected of operating illegally pending court action need to be upgraded to allow non-financial conditions to be imposed as part of the bonding arrangements such as insisting that a cVMS be installed.

The salience of this discussion is that conserving toothfish stocks is unlikely unless IUU fishers detach themselves from other rogue operators and align themselves with the *CCAMLR Sub-network*. To achieve such a shift, *interessement* devices embodied by material actor-networks (for example: procedures, detection technologies, laws and other inscriptions) are crucial in extending authoritative control in the sub-network because these intermediaries offer the capacity for human actor-networks to harness natural forces in the Southern Ocean and to increase the durability, forcefulness and mobility of their efforts to opportunistically pursue and apprehend IUU operators (see Latour 1987; 1988a; Law 1986: 257; Murdoch 1997b, 1998; 2000). However, they are not a panacea. Patrolling distant toothfish fisheries is expensive, and it may be difficult

to apprehend fishing vessels suspected of violations because political will, capacity and resources are significant constraints; and particularly so for high seas areas where States have no prevailing right (Beslier 2004; Kimball 2003).

International sanctions

Respondents emphasise the need for CCAMLR members and national governments to extend their actor-networks and adequately regulate the activities of their flag vessels, control FOC or trans-shipment vessels, and/or take appropriate action (such as port State control) to prevent IUU toothfish products being processed or traded (Figures 8.3 and 8.4).³³⁰ However, this is no easy task. The drawback of entrusting responsibility to the flag State is that some FOC or trans-shipment States may have little incentive or ability to exercise rigorously authority (Sections 5.2.2, 7.3.4 and 7.4.1). Similar to the views expressed by delegates attending the 2002 *International Conference on Illegal, Unreported and Unregulated Fishing* (INDNR/IUU) held in Santiago, Spain, many respondents recommend that on the high seas, exclusive flag State jurisdiction should be banned to States that show no interest in adhering to the standards that stem from international law and particularly CCAMLR (see MAPA 2002). They also highlight the necessity of flag States arresting non-complying vessels and deregistering known IUU vessels, and for vessels to be considered without nationality if the FOC State register does not comply with LOSC (see LOSC 1982 Part VII Article 92). State-less vessels would lose their power because they would not be entitled to fly the flag, or claim the protection, of any State and subject to the jurisdiction, inspection and law enforcement provisions of all States.³³¹

In this light, Respondent 18 advocates the implementation of an international and centralised IUU fishing vessel list in the form of a dynamic database that is managed by the FAO to track the activities of fishers and the vessels they operate.³³² For her, the database should be established in accordance with the IPOA-IUU, accessible by all relevant stakeholders and regularly updated. Other respondents also support the continued development of the regional CCAMLR *IUU Fishing Vessel List*, and positive authorised whitelists to identify and acknowledge the activities of those vessels operating in accordance with CCAMLR conservation measures and national laws (Respondents 38, 52, 62, 69 and 70). Such lists might encourage vessels to demonstrate their good standing, provide a disincentive for vessels to change names or flags once

³³⁰ See, for example: Beslier (2004); Bialek (2003); Choquet (2003); Clark & Hemmings (2001); Croxall & Nicol (2004); DeSombre (2005); Gianni & Simpson (2005); Molenaar (2003); Vidas (2000).

³³¹ Kimball (2003) also recommends standard vessel markings to make it easier to identify the flag State of fishing vessels that seek to hide their activities. FAO has also established *Standard Specifications and Guidelines for the Marking and Identification of Fishing Vessels*, and the UN Fish Stocks Agreement requires flag States to ensure that fishing vessels carry such markings (UN 2001 Article 18 3(d)).

³³² Australian toothfish fishers identify that IUU vessel lists (including the High Seas Vessel Registration System [HSVRS]) are limited by their restricted availability and rapidly outdated information. In particular, they recommend that the Lloyds Register publicly release relevant information contained on its databases (such as vessel insurance details) to help identify beneficial owners.

listed, help to establish genuine links between vessels and States, and may support some form of rights-based fisheries in the future (see AAD 2004c; HSTF 2006; Molenaar 2003; Stokke and Vidas 2004). Negative blacklists could also be developed for flag, port and market States involved in illegal activities (Respondent 25). Overall, respondents backed the development of national and international plans of action on IUU fishing including the *CCAMLR Plan of Action on Illegal, Unreported and Unregulated Fishing* (CPOA-IUU); dynamic and standardised vessel lists; the 1995 FAO High Seas Vessel Registration Database System (HSREG); and the development of a standardised global vessel marking system to permanently mark and identify fishing vessels (see CCAMLR 2004h; FAO 1998a).

Although current laws afford legal responsibility to the vessel or flag State rather than the fisher or beneficial owner, Australian toothfish fishers suggest that LOSC establish practical criteria for defining and establishing the genuine link between vessels and flag States and consequences for failure to meet those obligations that act as an effective deterrent to States acting in self-interest (see also AAD 2006; Churchill 1998; FAO 2004b). They also advocate that as a condition of entry into the CCAMLR fisheries, members could demand more transparency on beneficial ownership, corporate structures, operating costs, locations of enterprise and production facilities, vessel history and employment conditions in an effort to pressure IUU operators out of the industry. In addition, Macdonald (2004a) calls for amendments to LOSC to allow for the imposition of custodial sentences on fishers as a penalty and increase the seriousness with which fisheries offences are viewed internationally. In this regard, many States (including Australia, South Africa, New Zealand, Norway and Spain) act at a distance and apply restrictions to their nationals (fishers) anywhere in the world to ensure that international measures, to which these States are a party, are not undermined (Respondents 38 and 70).

With these issues in mind, some respondents ask how sanctions might be brought to bear on States that *hide* behind non-binding, voluntary agreements and fail to comply with CCAMLR measures, and suggest that formal international sanctions are needed to ensure they act for the common good (Respondents 11, 12, 15, 26, 28, 61 and 62). For example, Respondents 4, 6 and 8 call for the international community to impose harsher extra-territorial sanctions on IUU operators and the port and market States these operators use to land, process and market toothfish. This action is raised by 30 per cent of respondents (Figure 8.2). In this vein, Respondent 11 considers that “it is vital to impose more stringent penalties on illegal operators [such as captains and fishing masters] given that they command huge salaries” and are responsible for any infringements the vessel or the crew make. For example, legislation and court action could reverse the burden of proof and insist that operators prove their fishers’ and vessels’ innocence. Furthermore, INDNR/IUU delegates warn that if the captain fails to take authority (and responsibility) for a vessel under his/her control, there is a risk of

creating “captains of convenience” who can operate outside the law (MAPA 2002: no page). This situation is prevalent in the toothfish fishing industry where FOC vessels are regularly captained by Spanish and Uruguayan nationals that are able to evade national laws (Section 5.3.3). In this regard, Respondents 11 and 65 recommend that national governments reassess taxes paid by illegal operators and impose penalties retrospectively where all profits (including personal assets) are forfeited to the Crown. For Respondent 16, the “taxation system is ultimately where illegal fishers will become unstuck because countries ... are unlikely to turn a blind eye to tax evasion.”

Nonetheless, most respondents were unable to suggest how to impose effectively sanctions and penalties on dissident States, but did agree that binding agreements have been more effective in managing toothfish stocks than non-binding agreements, and that States failing to ratify international conventions and agreements remains a significant issue. They highlight the need for international regimes to use unambiguous wording to promote absolute compliance rather than an atmosphere of choice (see Edeson 1999; Houtte 2004). For example, CCAMLR members appear reticent to do anything other than *monitor*, *admonish* and quietly *raise*, through letter-writing, that certain stakeholders act dissidently (see AAD 2005d; 2006). Words such as *will* and *shall* appear rarely in the Convention on the Conservation of Antarctic Marine Living Resources whereas *should* and *may* appear often. Respondents also highlight the need for States to implement harmonised extra-territorial application of domestic criminal and civil sanctions.³³³ For Miller *et al.* (2004: 357), “comparability, or equivalence, of imposed sanctions is essential to effective deterrence.” For example, national legislation similar to the United States *Lacey Act* could be introduced by States to make it an offence to deal in illegally caught products anywhere in the world (Respondent 49).³³⁴ States also need to increase the penalties for national and foreign fishing offences under national *Crime Acts*, in an effort to ensure that penalties act as a deterrent rather than being considered merely as a cost of doing business (Respondent 16).³³⁵ In addition, the costs of *hot pursuits* ought to be included in any bond set for an apprehended vessel in an effort for the apprehending State to recover costs (Respondent 70). For Respondent 28, the ultimate solution is a system of “federated mechanisms for global governance with legislative, executive and judicial powers, the ability to raise income through

³³³ See, for example: Downer & Parer (1998); Fallon & Kriwoken (2004); Graham (1998c); Norway (2002; 2003); Williams & Hammer (2001).

³³⁴ The *Lacey Act*, as amended in 1981 (16 U.S.C. 3371-3378; Pub. L. 97-79, as amended) repeals the Act of May 20, 1926 (*Black Bass Act*; 16 U.S.C. 851-856), §5 of the Act of May 25, 1900 (16 U.S.C. 667e), and 18 U.S.C. 43-44 (the original *Lacey Act*) (OPIS: date unknown). This Act makes it illegal to trade fish, wildlife, or plants taken in violation of any United States or Indian tribal law, treaty, or regulation or traded through violations of foreign law (NCSE: date unknown).

³³⁵ Australia has a two-tiered penalty system for foreign fishing offences. Vessels 24 metres and over are subject to a higher penalty, which is up to US\$623,000 (up from US\$416,000) or 7,500 penalty points (each penalty unit is set at US\$83 under the *Crimes Act 1914*) (Australia. 2005d; Respondent 70). The Australian Government has a provision to include the costs of the pursuit in any bond set for an apprehended vessel. This aspect is currently untested in international law and if Australia is taken to the International Tribunal for the Law of the Sea this provision may be deemed as *unreasonable*.

taxation, and universal powers of enforcement.” Participants to the 2005 *CCAMLR Symposium* also suggested that taxing fishing effort was one possible economic tool for regulating the tendency to over-fish (AAD 2005d). Unfortunately, because international laws presently only apply to those who agree to be bound by them, the global community is politically a long way from achieving collective legislative or taxation controls in relation to the fisheries. However, an actor-network of harmonised international regimes, Court indictments, national policy and laws (including retrospective tax legislation) that are drafted with unambiguous wording all have a capacity to connect with one another and act as a powerful governing deterrent to impede the activities of IUU fishers.

8.3 Promoting sustainable resource management by non-state actor-networks

This section focuses on the second principal strategy where the majority of respondents call for non-state actor-networks to promote sustainable and multi-level resource management. They strongly support action to foster socially constructed partnerships between stakeholders and co-management strategies to manage toothfish stocks, in an effort to constitute a new nature and a new society based on political, social and biological configurations. In particular, 69 per cent of respondents across all actor-network categories comment on the benefits of including the fishing industry in the management of the toothfish. However, only 50 per cent of officials and fishery managers advocate this approach, possibly because they remain reticent about relinquishing to the fishing industry State control (and power) over the fisheries they manage (Figure 8.1). At the same time, some respondents also urge stakeholders to respect the contributions that others provide to the debate, including those made by interested members of the general public.

8.3.1 Partnership approach

Respondents were resolved in their support for all stakeholders being included in managing the toothfish resource, with 80 per cent of respondents backing the promotion of general co-management strategies (Figure 8.2). Their resolve further illustrates a realignment in the *Patagonian Toothfish Network* from State-led management approaches towards multi-levelled decision-making procedures (see Cole 2003; Eckerberg & Joas 2004; O'Brien 2002).³³⁶ Moreover, many respondents recognise that conflicts are costly in environmental, social, and economic terms. Their views accord with Wolfrum (1985: 175), who argues that “public participation enhances the viability of government decisions because the substantive results are usually better” and policies formulated without public consultation can lead to decisions outside political consensus, which in turn can lead to community resistance (see also Borrini-Feyerabend 2000; Hermes &

³³⁶ For O'Brien (2004: 2), “multilevel governance focuses upon formal political institutions and assumes a high greater degree of community among the governed ... Multilevel approaches are also very concerned with policy effectiveness.

Mikalen 1999; Jentoft 2000; 2005; Mansfield 2004; Symes 1997).³³⁷ In addition, governments can use moral persuasion by the group to change the actions of dissident players. However, Jentoft *et al.* (1998) recommend that co-management remains adaptive because eco- and political-systems are not static and many opportunities and problems created by this relatively new management approach are yet to be discovered. Holm (1999; 2001) also suggests that this undeveloped approach is a demanding one given that fishers need to forsake self-interested rationality and accept authoritative rules, negotiate agreements over access and quotas, and assume moral responsibility and self-management to champion collective well-being. Therefore, building partnerships is a difficult and multi-faceted task because actor-networks have different ways of doing business and degrees of entitlement in the debate, and many cross-cutting conversations are needed to build connections between them.

Nonetheless, and in an effort to restore power to and/or retain power in the fishing industry, fishers and industry operators support full participation of the legitimately licensed toothfish industry in management discussions. Although not irrefutable, they consider that declines in IUU toothfish activities have resulted from their efforts to cooperate with stakeholders, share IUU fishing information and develop technologies to reduce environmental impacts. In particular, they see organisations such as COLTO and SARCP as contributing in significant ways to managing and conserving toothfish because they effectively connect with other actor-networks; raise awareness amongst the licensed fishing operators, wholesalers, and consumers about sustainable fishing practices and eco-friendly toothfish products; apply peer pressure to IUU fishing operators; and develop mechanisms to monitor, report, and arrest IUU fishing activities (Respondents 11, 15 16 and 20). Despite manifold success and increased influence (Respondents 11 and 20), industry efforts still need to be undertaken “in tandem with larger government organisations and authorities” (Respondent 7) and licensed fishers should continue their efforts toward self-managing and cooperative multilateral relations (Respondent 9).

Respondent 31 also advocates that governments fully engage with fishers and he draws upon his mixed experiences in managing the Chilean toothfish fishery. For him, the disengagement of Chilean fishers from management discussions resulted in their failure to acknowledge “the real [unsustainable] situation of the fish stock and the fishery” and they have resisted or not responded to the implementation of the Chilean ITQ system or lower TACs that have been applied by the Chilean Government to account for the diminishing high seas fish stocks (Respondent 31). In addition, inadequate and/or inaccurate fisheries research data were collected from fishing vessels. Consequently, because Chilean fishery managers were unable to develop an effective fisheries model, the Chilean Government progressively applied a negotiation strategy based on political

³³⁷ Co-management occurs when State officials and fishing industry operators share management responsibility; community management occurs when marine resource users manage themselves.

trust and gradual and incremental implementation of fisheries management measures that included reducing TACs in the toothfish fisheries and taking social imperatives into account (Respondent 31). The Chilean Government also created Technical Fisheries Committees to include stakeholders in decision-making and provide technical information to industry. Respondent 37 suggests that for small-scale, coastal fisheries that are similar to the Chilean artisanal toothfish fishery, the creation of such an approach may help to change fishers' behaviour. He also supports the establishment of industry organisations because they "promote industry participation" in fishery management decision-making, increase "a feeling of resource belonging" amongst fishers and improve the effectiveness "of compliance, monitoring and enforcement" because fishers can pressure other industry members.

Respondent 40 also recommends that CCAMLR members encourage fishers to be less competitive and secretive because this strategy can disadvantage them. She identifies that the British Government has no industry representation in the United Kingdom delegation to CCAMLR because fishers seek to protect their commercial interests. As a result, the development of conservation measures (i.e. longline streamer lines) in the toothfish fisheries can occur without discussions with industry and subsequently are not supported and/or implemented by fishers. Respondent 2 also reflects upon Japanese fishers as a good example of how the "incredibly secretive" way they do business can disadvantage them. He recalls that Japanese fishers developed a method of krill fishing that reduced fur seal bycatch in the early-1990s and involved installing fur seal escape hatches in the nets. However, Japanese fishers failed to inform other fishers about the success of the measures and although this was not a commercial-in-confidence issue, they remained secretive. Considering that Japanese fishers could have attracted significant international support and good will for these measures, their actions disadvantaged their efforts to collaborate with other actor-networks.

In addition, 48 per cent of respondents actively support increased cooperation with other non-state actor-networks (including ENGOs and selected members of the general public) in toothfish management fora (Figures 8.2, 8.3 and 8.4). Notably, ENGO respondents widen the debate and suggest that substantial gains can be made from ENGO representatives cooperatively working with licensed fishers to exert pressure in the toothfish management debate. For example, an informal international meeting organised by the legitimately licensed toothfish fishing industry and WWF, held in February 2005 in Canberra, Australia, brought together the collective views of governments, fishers and ENGOs in an international sub-network. It aimed to develop an action plan to encourage States to sign, ratify and implement the UN Fish Stocks Agreement, Compliance Agreement and CBD, and to support other agreements including the OECD Ministerially-led High Seas Task Force on IUU Fishing and organisations such as CCAMLR as a way forward for effective management of the high seas (WWF 2005b). They cooperatively developed the *Manuka Vision Statement* where:

Government, Industry and NGOs collaborate so that by 2015 the high seas are managed to ensure that the integrity of healthy ecosystems is maintained; fisheries resources are used sustainably and equitably with all states, fishing enterprises and other stakeholders acting responsibly; livelihoods and rights are preserved; populations of threatened species are protected and restored ... for the benefit of present and future generations (WWF 2005b: 2).

Given the limited opportunities for selected members of the general public to enter the toothfish management debate, Respondent 52 proposes that national governments hold public meetings to highlight current developments in the toothfish fisheries and to raise community awareness. She refers to the open public meeting of the Australian SouthMAC that is held annually in Hobart, Australia, to inform interested members of the general public about Southern Ocean marine issues (Sections 2.3.4 and 4.4.7). However, having attended these meetings over a four-year period from 2002, I observed that few external people attend, and on one occasion, I was the only non-SouthMAC attendee. One contributing factor for such limited public attendance is inadequate publicity; one small advertisement appears in either a national (*The Australian*) or local (*The Mercury*) newspaper up to six weeks prior to the meeting. Respondent 56 also points out that in the five years he has attended Australian CCF meetings as an observer, very few members of the general public have attended. For him, although CCF meetings provide an opportunity for informed NGOs to contribute to the CCAMLR process, members of "the general public are unlikely to know about the forum and even if they did, they would need very good contacts to know ... when the forums are held and whether it is possible for the interested party to participate" (Respondent 56). He argues that although he has a right to attend the forum as a community member, he feels like a scrutinised outsider (see Bradshaw & Stratford 2000; Gans 1968; Hughs 1960; Rock 1979). As a CCF observer since early 2003, I concur with this respondent's views. In Australia, the general public is largely unaware of meetings that are open to them, or they might feel intimidated by official members once they do participate. Given that public access issues arise in Australia, which is a State recognised for its open and constructive debate on the toothfish fisheries, it is less likely that community members will be invited or feel comfortable to attend similar meeting in States with less open and supportive fishery authorities.

This discussion highlights that fishery management committees and other fora seek to capture actors and networks into their own actor-networks to increase their power, knowledge, perceived transparency and capacity to influence other actor-networks. Paradoxically, they also actively seek to retain power in official spheres such that their members leave little room for hidden actor-networks to participate or voice dissenting views. In addition, they never fully silence all their members and other participants, nor do they necessarily speak on behalf of these stakeholders. Therefore, these actor-networks cannot be completely black-boxed and the fishery management committees and other fora are not ultimate head-actor-networks at national governmental levels.

8.3.2 Co-management model

Despite the compound tension between fishery management committees and other fora seeking to capture external actors and networks into their actor-networks but retain power amongst their members, many respondents advocate that governments apply co-management strategies to manage toothfish stocks. Take, again, the example of the Australian toothfish fishery presented in Section 4.4.7. Australian fisheries managers arguably use a successful co-management model to bring to the negotiation table government, industry, scientific, academic, and NGO representatives with an interest in toothfish (see SouthMAC and CCF meetings). The toothfish is also transformed to the negotiation table via *intermediary mobiles* such as catch statistics, abstract modelling data and maps. According to Respondents 17 and 54, over time, the model's dynamism has contributed to improvements in government-industry partnerships to include other stakeholders. In addition, fisheries management arrangements, proposals, and plans are distributed and advertised publicly and comments are sought. Overall, Australian fisheries managers, policy-makers and enforcers agree that they achieve better outcomes using this co-management approach and domestic legislation to manage Australia's toothfish fisheries than by applying international law and CCAMLR conservation measures (Respondents 29, 55, 57, 59 and 70). Because the Australian toothfish fisheries are closed access, low volume-high value fisheries, fishers can take a long-term view to environmental, marketing and labor issues and international, state and local developments. In the five years that Respondent 54 chaired the Australian SouthMAC, fishers did not advocate watering down the environmental constraints imposed by the Australian Government for similar reasons.

Australia's co-management model cuts both ways. The fishing industry provides input into decision-making processes and ENGOs must have their claims about how the fishing industry operates tested at the negotiation table to which they are also party. Co-management creates a forum where the information flow helps dissipate controversy from the toothfish fisheries and, in relation to the toothfish, "was developed in a modern era, with modern environmental and commercial constraints, and under the new range of international treaties and agreements" (Respondent 54).

Australian actor-networks contend that the effort required to retrofit the co-management model to existing fisheries around the world should not be underestimated. In Australia, environmental constraints began to affect commercial fishers in the early-1990s and it took them approximately five years to become accustomed to co-management regimes. Initially in denial and then opposition because they were attuned to the historical arrangements that had been developed over the previous 100 years, fishers have experienced a sea change in their attitudes with regard to ensuring sustainable fisheries and implementing environmentally sensitive fishing practises (Respondent 54). It was during this period that the HIMI Patagonian toothfish fishery developed, and the fishers accessing this fishery have come to realise that they need to consider community

opinion and behave appropriately by ensuring sustainable catch levels and methods of fishing that comply with domestic and international legislation and conservation measures. Although there are only five Australian fishing companies with an interest in toothfish and that have contributed to management discussions over the past few years in Australia, their ability to cooperate successfully with one another and the other stakeholders is considered exemplary by Australian fisheries managers and ENGOs and they are seen as inventing innovative ways to achieve these broad objectives and maintain their commercial interests (Respondents 12, 54, 55 and 70).

Nevertheless, Australian co-management has not been without challenges (Respondent 12). Scientific uncertainty, a lack of understanding and limited knowledge about the ecological and social effects of over-fishing have been cited as possibly the most significant hurdles to overcome, especially when new players enter the fray. For example, the Australian Government has had at least seven Ministers in charge of fisheries over the past decade. In addition to complying with Australian fishery legislation, changes in management and conservation objectives have accompanied the introduction of and refinements to the EPBC Act, increasing the need for commercial fishers to liaise with Federal agencies and authorities, and especially the DEH, DAFF and AFMA. Licensed Australian fishers consider that these *top-down* and cumbersome bureaucratic structures can result in the inability of governments to take decisive action (Respondents 6 and 14), and “very high environmental standards ... have made life for Australian fishers particularly difficult” (Respondent 16).

Equally, licensed fishers acknowledge that some Australian Government representatives have been concerned that the fishing industry may put a *spin* on issues to further its case, or that the links between national fishing companies and larger international fishing companies might be problematic because they may be connected in some capacity to, or may have been involved in, IUU fishing activities. Although co-management is respected and effective in Australia’s toothfish fishing management arrangements, Respondent 6 points out that both vested interest and conflict of interest occur in Australian fisheries management generally, and AFMA’s associations and links with certain members of the fishing industry may make it difficult for this organisation to act objectively when making fishery management decisions.

Respondent 63 also provides valuable insights into the North Pacific fisheries and identifies that many issues impacting these fisheries are similar to those impacting the toothfish fisheries. As such, he supports co-management arrangements implemented by the North Pacific Fishery Management Council (NPFMC) to manage these fisheries.³³⁸

³³⁸ United States authorities stopped fishing by foreign operators within the United States maritime zones in 1988 after the Alaskan groundfish fisheries were over-exploited (Respondent 63). An artificially low TAC was imposed by the NPFMC for the fisheries that was set at two-thirds of the biological allowable catch, large marine areas were closed to trawling and a complex management system was developed to protect the fisheries and reduce bycatch (particularly the highly endangered short-tailed albatross).

The Council comprises of stakeholders with diverse interests and they are required by law to take sustainability and precaution into account when considering *optimal yield* and setting TACs (Section 3.2). This respondent also identifies that the Alaskan fishing industry and the industry-led Marine Conservation Alliance (MCA)³³⁹ cooperatively drive management and conservation outcomes for the North Pacific fisheries by employing professional and experienced scientists and lawyers to participate actively with the NPFMC. In addition, an Advisory Panel of interested groups including ENGOs also provides advice to the NPFMC on socioeconomic issues. Again, the authority of science and law is triumphant over other forms of governing and knowledge, and scientists and lawyers have provided legitimacy to the MCA because they are considered to hold the answers for sustainable Alaskan fisheries management.

Conversely, Respondent 63 refers to ENGOs as being “on the war path ... for ever causing trouble ... and for ever litigating frivolous endangered species issues.” He criticises them for pushing self-interested political agendas rather than promoting environmental protection and considers that many are funded by large foundations with political mandates. He also criticises United States environmental laws that “are such that they [ENGOS] occasionally win”, stresses that the MCA “will be fighting this battle” and advocates that if “the system works in Alaska ... don’t change it, use us [Alaskan fishers] as an example for fishery management elsewhere” (Respondent 63). However, although fishers in the North Pacific fisheries consider they own the resource and are the bastions of all knowledge needed to manage the fisheries, conflict occurs between competing actor-networks and court actions have been pushed by ENGOs through the United States Congress (see Center for Biological Diversity 2004). These actions imply community opposition to NPFMC and industry decisions. Therefore, the Australian toothfish co-management model that attempts to bring cooperatively all stakeholders to the negotiation table appears to be more successful considering the high degree of publicly acknowledged respect that Australian stakeholders hold for one another and the absence of legal proceedings directed at the Australian toothfish fisheries.

8.4 Promoting dialogue and cooperation

This section focuses on the third principal strategy where 80 per cent of respondents across all actor-network categories consider the importance of promoting dialogue and cooperation more generally between stakeholders to build capacity and reduce conflicts between States and organisations at the international level. In particular, 92 per cent of scientists and researchers support this approach (Figure 8.1). They discuss a range of actions to support this strategy including those centred on understanding cultural differences, de-politicising negotiations and understanding how stakeholders with long-

³³⁹ MCA is an Alaskan INGO formed by conservation-minded North Pacific coastal residents (including fishers, traders and consumers) involved in the North Pacific groundfish fisheries (MCA 2005).

term knowledge on the toothfish might work cooperatively with new players that may bring new perspectives and ways of doing business to the discussions.

8.4.1 Understanding cultural differences

Many respondents describe the need to work together as *absolutely necessary*. They advocate including all stakeholders in toothfish research, decision-making, monitoring, enforcement and education, and building mechanisms to raise environmental awareness regarding the sustainability of the toothfish and the social aspects of fishery sustainability in terms of employment, wealth, and net social benefits. However, Respondent 45 warns that determining “how much stakeholder consultation is enough” is important because full stakeholder consultation is costly. For him, balance is needed between open-ended consultation and the costs associated with conducting consultation.

In this light, some respondents identify that although conversation and cooperation involve potential conflicts as well as synergies between stakeholders, they ought not to be afraid of the cost involved or divergences in opinion because new ideas bring new ways of doing business to the negotiation table and build self awareness. For Respondent 32, conflicts can be addressed through consensus-building and raising awareness through adversarial processes (usually judicial) when consensus is not possible or becomes too expensive. Nonetheless, addressing conflicts through adversarial processes may be “a waste of resources, time, and energy ... [if] all the intelligence available is mobilised in a polarised process in which each party tries to prove the other wrong” (Respondent 32). Alternatively, it may be more efficient to put all the stakeholders’ intelligence to work to find solutions that are optimal for the entire actor-network, and that include the fish and ecosystem as well as the human stakeholders (such that is sought in the Australian toothfish co-management model). Importantly, conversation and cooperation help develop transparency, bring positions closer, and build upon understandings about others. Situations arise where fishers are not automatically considered to be exploitative; environmentalists are not always considered as taking extreme environmental positions; and scientists, managers, and politicians are not seen as promoting only political interests. This approach acknowledges disjunctures or hardened positions that may require adversarial processes to stop an activity (say IUU fishing) or implement a new strategic approach (say vastly improved global governance). In these cases, conversation and cooperation remain vital in reducing, as much as possible, conflicting impasses (see Fallon & Stratford *forthcoming*). In this respect, Borrini-Feyerabend (1997: 64) states that NGOs “can play a tremendously important role in conflict resolution” and although their role and power in society vary, they are increasingly wielding considerable influence. As the success of various NGOs illustrates (for example: ASOC, WWF, TRAFFIC, MSC and COLTO), their ability to contribute to conflict resolution depends on what the group is set up to do and their campaigners’ visions, resources and credibility with other actor-networks.

Respondent 49 supports cooperation because he considers it crucial to the successful implementation of LOSC, and the ATS and Convention on the Conservation of Antarctic Marine Living Resources.³⁴⁰ In particular, the Convention includes the obligation to cooperate with other organisations where Article XXIII states the following:

The Commission and the Scientific Committee shall seek to develop cooperative working relationships, as appropriate, with inter-governmental and non-governmental organisations which could contribute to their work ... the Commission may enter into agreements with ... other organisations as may be appropriate" (CAMLR Convention 1980 Article XXIII).

Respondents recommend that cooperation be promoted by listening, respecting the views of others, keeping the lines of communication open and sharing knowledge. In addition, Respondent 39 suggests that it is promoted by de-politicising the negotiation process and rather than debating national allocations, where stakeholders focus on the sustainability of the toothfish and ecosystem. In this respect, dialogue can be fostered using chains of intermediaries to connect actor-networks in the *Patagonian Toothfish Network*. Direct methods can be implemented through stakeholder meetings (for example: face-to-face conferences, video conferences, workshops, working groups and consultation fora) that seek to balance the rights of all actor-networks in discussions and decision-making. Indirect methods can also be implemented through the distribution of texts including reports and formal publications. Other inscriptions such as communication campaigns can also be mobilised using the Internet, email and media broadcasts.

Respondents 24, 25, 36 and 41 also refer to how cultural differences that exist between States influence diplomatic negotiations. They recommend that stakeholders acknowledge and respect these differences before pushing their own organisational or national interests. For Respondent 24, Asians conduct business in a non-conformational manner: firstly they seek pleasure, socialise and discuss cultural issues, after which business is discussed. Given that English-speaking developed States are most influential in CCAMLR fora, he suggests that they try to understand these subtleties and remain attentive to the cultural styles of other less powerful States when negotiating management or conservation outcomes. Respondent 34 also explains that when negotiating issues within CCAMLR it is important for members to consider the different negotiation styles that national delegations bring to the negotiation table if constructive outcomes are to be reached. For him, British and Australian delegates might be considered by others to negotiate in a brash manner. Conversely, Latin American delegations use an inclusive style and like to involve all parties in the

³⁴⁰ The FAO involves all stakeholders in decision-making and uses a staged cooperative process that involves articulating the issue; including the pros and cons and possible positions and options; organising experts to consider issues and elaborate, validate or correct findings; organising technical consultations with governmental experts who combine technical knowledge with socio-political considerations; and organising governmental summits to consider outcomes and take the final decisions (Respondent 32).

discussions. Alternatively, Americans hold back and listen to discussions and then enter the debate in a manner that others might consider as heavy-handed. Japanese delegates are different again, and they are very direct and unswerving about their national position. There are also differences within each CCAMLR delegation. Some delegations have diplomatic heads whereas others have individual responsibilities and these delegates are often passionate about the issues and bring their own personal styles to the negotiation table. Despite these differences, Respondent 34 urges other stakeholders to respect the long-held connections between CCAMLR delegates and their extensive knowledge of the issues.

This discussion emphasises that compound tensions, especially between those members that seek to retain their long-held power in CCAMLR and others that seek to introduce new people and knowledge into the Commission, drive the debate. The debate centres upon whether there are added benefits in building knowledge capacity and fostering ongoing relations between those that have been traditionally involved in CCAMLR or whether new blood ought to be captured into CCAMLR and the *CCAMLR Sub-network* (Section 7.3.1). Despite the frictions that centre on succession planning within CCAMLR and how to negotiate around conflicting national positions, some respondents highlight that understanding what pressures or interests lie behind each position and what flexibility or trade-offs may be possible in order to reach solutions is required between all stakeholders. For them, skillful drafting of recommendations or mechanisms is then necessary in multiple languages to enhance access and understanding. As such, these respondents acknowledge that understanding cultural differences includes distributing power equitably between actor-networks using intermediaries (including negotiations, texts and languages) to produce meaningful conversions if capacity is to be built upon and conflicts reduced.

8.4.2 Building capacity

Respondents 49, 52 and 62 emphasise the need for developing scientific understandings, fostering collaboration and increasing education. For them, these are key actions to invoke broad-scale cultural and social change, and build responsible fishing practises. However, they also recognise that developing States involved in the toothfish fishing industry or CCAMLR may not have sufficient power, knowledge or resources to comply with CCAMLR conservation measures, or have an adequate administration to enact legislation to manage the fisheries or fishing activities under their jurisdiction, or deal with IUU activities (see Cordonnery 1998; HSTF 2006; Strigl 2003; Trent *et al.* 2005). For example, when the developing State of Namibia joined CCAMLR, it was difficult for the Namibian Government to support a national CCAMLR delegation although it did gain access to the knowledge and research of other CCAMLR members. CCAMLR members openly acknowledge the achievement of Namibia joining CCAMLR but also recognise that many other developing States (such as Mauritius, Seychelles or Kenya) cannot afford to attend CCAMLR meetings. Therefore,

Respondent 49 urges more powerful and wealthier CCAMLR members to find ways financially to assist less wealthy States. This approach allows CCAMLR members to know what activities other States are engaged in, and likewise, it builds capacity and enables less wealthy States to learn and access knowledge and information. Although the Convention on the Conservation of Antarctic Marine Living Resources does not specifically include building capacity as a main function of CCAMLR, Denzil Miller, CCAMLR Secretary General, stated at ATCM XXVII that CCAMLR members were “considering ways that developing States can be encouraged to participate in work and be invited to the Commission’s meetings” (ATCM XXVII 2004, Item 4(36)).

In 2005, CCAMLR members also supported the development of a capacity-building program and enhancing cooperation between CCAMLR and non-Contracting Parties that may have the will, but not the capacity, to implement CCAMLR principles and measures (see AAD 2005d; 2006). In addition, the Australian delegation to the twenty-fourth CCAMLR meeting in 2005 supported capacity-building as a high priority and suggested that such a program should include targeted outcomes, a focus on technical cooperation, flexibility to tailor cooperation on a case-by-case basis, a partnership model, and a central repository for information held by CCAMLR (CCAMLR 2005h). Other international instruments (such as LOSC) also strongly mandate the need for capacity-building between States, but CCAMLR members and national governments are yet to address the call in a practical sense. However, this discussion underscores the point that respondents support capacity-building between stakeholders to ensure that developing States are willing and able to participate in, and comply with, the various international instruments rather than changing or weakening the regimes’ overarching principles to appeal to national positions.

Some licensed fishers extend the debate and advocate that an environmentally aware culture within the fishing industry is a key action to ensuring ethical frameworks, strong environmental philosophies, best practise procedures and sustainable fisheries. An environmentally aware culture also makes good economic sense. Given the significant resources needed to access these distant fisheries located in hostile Southern Ocean waters, it is not in the interests of legitimate fishers to lose their continued access rights to a fishery within weeks if a vessel’s crew fails to comply with State and/or CCAMLR conservation measures. For example, if Australian fishers exceed seabird bycatch catch limits or fail to comply with conservation measures set by AFMA under the 2003 *Antarctic Fisheries Bycatch Action Plan* at the national level (AFMA 2003b) and CCAMLR conservation measures 25-02 (2003) and 25-03 (2003) at the international level (CCAMLR XXIII 2004a), they must cease fishing and immediately leave the fishing area for the remainder of the fishing season. For Respondent 16, the “culture onboard the vessel is a very important factor leading to environmentally sustainable fishing outcomes ... you need the ‘right’ culture ... and although you may have it at the top, it is important to get it through all levels of the company for it to work.” To achieve

the right company culture, Respondent 16 advocates keeping “the crew focused at all times [on positive environmental outcomes] ... by providing training and incentives to the crew through bonuses and rewards for good observations and the development of [environmentally sensitive] fishing techniques.”

8.5 Promoting research and reducing uncertainties

This section focuses on the fourth principal strategy where many respondents call for additional research to reduce uncertainties in the toothfish fisheries. They focus upon reducing environmental impacts in the toothfish fisheries and the relative merit of establishing an adequate and representative system of MPAs in the Southern Ocean to protect the stocks. Overall, 63 per cent of respondents back this strategy. In particular, 92 per cent of scientists and researchers; over 60 per cent of officials, fishery managers and NGO representatives; and 39 per cent of fishers and industry operators voice their support (Figure 8.1). Notably, respondents most likely to hold scientific understandings are those who champion this strategy most strongly, although licensed fishers do acknowledge that fishing can result in negative environmental impacts and have directly contributed to improving fishing procedures and technologies (Respondents 7, 8, 12 and 16). The hidden issue of farmed toothfish also emerges in this discussion. Although no respondents considered the possibility of farming toothfish, Fundación Chile, a Chilean non-profit, technology development institution, identifies that Patagonian toothfish juveniles are being successfully farmed in Chile in controlled aquaculture environments. Given that an additional supply of around 50,000 metric tonnes might be generated by Chilean aquaculturalists for the fresh market over the next decade (calculated at about US\$200 million annually at wholesale prices), this institution advocates increasing research to assess the relative merits of this industry (see Fundación Chile 2004).

8.5.1 Reducing environmental impacts

Fifty-six per cent of respondents across all actor-network categories advocate improved procedures and/or technologies to mitigate bycatch or other environmental impacts from fishing activities (Figures 8.2, 8.3 and 8.4). In particular, many licensed fishers support the development of an adaptive management approach and the incremental improvement of their fishing practises to reduce environmental impacts as more information becomes available. These efforts are acknowledged by 25 per cent of respondents (Figures 8.2, 8.3 and 8.4).³⁴¹ Licensed fishers have trialled a range of procedures and technologies such as considering the merits of *pulse fishing* in the toothfish fisheries, which is where fishers concentrate harvesting efforts one year and then let the fishery rest for the following five years, although this method has proved too difficult to manage (Respondent 49). In particular, the efforts of Australian and New

³⁴¹ Adaptive management demands that hypotheses/mechanisms be tested and that alternative models/mechanisms be considered (see Johnson 1999; NMFS 1998). It tries to incorporate all stakeholders views, accepts that management must proceed despite the lack of information, and adapts.

Zealand fishers to reduce incidental bycatch have been exemplary. For example, they have used a *moonpool* system where the longline gear is hauled up through the centre of the vessel to mitigate seabird bycatch, and developed the *bridle curtain* mitigation device that is draped over the side of the fishing vessel around longlines to stop seabirds coming close to the fishing gear and taking baits off longline hooks (Scott 2003; 2005; AFMA 2005b) (Appendix E). Australian fishers are also trialling pot fishing that catches up to 100 kilograms of toothfish per pot and mitigates against seabird bycatch and whale interactions because the pots can be set at greater depths and target older toothfish (resulting in less impact upon pelagic toothfish stocks because juveniles are not targeted) (Australia 2005b, e; 2006). These fishers have also worked with scientists and other industry operators from Australia and New Zealand, governments, members of SSS and fishing gear manufacturer Fiskevegn A.S. Norway to stop seabird bycatch on longlines and develop an internationally recognised integrated autoline weighted (IW) longline system (Respondents 16 and 56; *Scoop Media* 2003; SSS 2003b).³⁴² This system ensures that IW longlines enter the water smoothly and quickly (with 50g lead/m integrated weight and sinking 2-2.5 times faster than unweighted [normal] lines), and that hooks enter the water before seabirds can take the bait (AAD 2004d).³⁴³ Here, fishers have captured other actor-networks (including scientists, government officials and ENGOs) into their own actor-network by mobilising intermediaries (including improved fishing technology and practises) and have increased their influence and power by promoting environmentally responsible fishing.

Respondent 51 identifies that fishers will purchase new gear if it fishes as well or better than current gear and they will deploy new gear once it has been purchased. Therefore, compliance issues are reduced in a *de facto* way because the behaviour of fishers is changed through personal choice and commercial efficiency. However, given that the IW longline system has only been developed for autoline gear, Respondent 51 suggests that new solutions be developed for fishing vessels using other fishing gear, such as Spanish longlining gear used mainly by IUU operators (Section 4.2.2). In this vein, Respondent 35 suggests that developing international standards for gear is paramount because it would also force IUU operators to adopt gear that reduced environmental impacts and bycatch problems, again, in a *de facto* way. For him, standardised gear and gear markings would help identify both the vessels from which lost or discarded gear comes (especially when IUU fishers cut loose gear to escape authorities) and the manufacturers or traders that make gear available to rogue operators. Respondent 22 also proposes that licensed fishers tag larger and more valuable toothfish to verify that they have been caught in accordance with CCAMLR conservation measures.³⁴⁴

³⁴² Funded by New Zealand Longline Ltd, Fiskevegn A.S. Norway's Australia/New Zealand agent Gourock New Zealand and AAD, the trial was extended to the HIMI toothfish fishery in November 2003.

³⁴³ In an effort to promote industry leadership and new procedures to protect seabirds, John Bennett, a SSS member and Sanford Ltd skipper, won the 2002 *Golden Albatross Award* at the second International Fishers Forum in acknowledgement of his commitment to eliminate seabird bycatch (SSS 2003b).

³⁴⁴ However, it is unrealistic to tag all fish and tags would need to be difficult to forge by IUU fishers.

In addition, Respondents 26, 34, 57 and 68 state that there are good datasets collected from random stratified trawl surveys in some fisheries like those in HIMI waters, but little research has focused on the impacts associated with longline and pot fishing despite many fishers converting their trawl operations to these methods.³⁴⁵ They recommend specific research to assess the environmental impacts of longlining and potting and note the differing environmental damage caused by trawling and longlining fishing techniques. Respondent 17 also argues that “although longlining has had it problems in the past, it is now a more environmentally sensitive fishing technique” and Respondent 16 argues that “the rewards offered by longlining far exceed those offered by trawling ... because it does not indiscriminately catch non-target species.” For him, longlines are also floated just above the seabed and, therefore, there is very little interaction with the seabed. However, Respondents 26 and 68 identify that although longlining does result in less environmental impacts than trawling, this method is not benign and autolines damage benthic species when they are dragged across the seabed. They stress that additional research is needed to develop longlines that sink fast to stop seabird bycatch and do not cause damage to benthic communities. The relative merit of toothfish fishing methods and gaps in the research where respondents advocate the need for increased scientific understandings is detailed in Table 8.1.

Table 8.1: Relative merit of trawling, longlining and potting

Impact	Trawling	Longlining	Potting
Toothfish	Less selective	More selective	Can target older fish
Fishing depth and catch weight	400 to 800 metres 4 kilogram average catch weight	12,000 to 17,000 metres 6 kilogram average catch weight	500 to 1,000 metres 13 kilogram average catch weight
Fishing season	Longer – vessel strikes and pollution potentially greater	Shorter – vessel strikes and pollution potentially less	Longer – vessel strikes and pollution potentially greater
Gear loss	Potentially less gear loss	Potential gear loss	Poorly assessed – but pots potentially lost
Seabird bycatch	Limited effects	Potential effects greater	Potentially limited effects
Marine bycatch	Increased icefish, shark and rockcod bycatch	Increased skate, ray and grenadier bycatch	Cetaceans and fish bycatch may be attracted to pots
Mammal bycatch	Potential netting and drowning	Limited effects	Potential capture and drowning
Benthic habitat	Impacts to species such as sponges and shellfish	Potentially less impacts	Potentially limited effects

As such, Respondents 4, 16 and 20 maintain that it is insufficient for CCAMLR members, national governments and licensed fishers to improve fishing procedures and technologies or stop IUU fishing. For them, trawling activities need to be banned

³⁴⁵ Only one study, the NMFS AFSC Processed Report 98-01, describes the retrieval of bottom longline gear observed from a manned submersible (Australia 2005b).

because they damage benthic communities and indiscriminately target toothfish breeding populations when they harvest large catches of undersized fish found in shallow waters. CCAMLR members are also concerned that trawling potentially impacts benthic habitats (CCAMLR XXIII 2004a §10.87; Respondent 50), and the Deep Sea Conservation Coalition (DSCC)³⁴⁶ called on United Nations Informal Consultative Process on Oceans and the Law of the Sea (UNICPOLOS) delegates to back a UN General Assembly resolution prohibiting high seas bottom trawling in June 2004 (see ASOC 2004c; Currie 2004; DSCC 2004; ECBP 2004; Kimball 2003; 2004).

Overall, respondents propose that additional research is needed to assess the environmental impacts that various trawl, longline and pot fishing methods might have on toothfish stocks, toothfish habitats, seabirds, other bycatch and benthic communities. However, they note that fishing gear used by toothfish fishers is a complex issue and licensed fishers are often legally obligated by national regulation to use specific fishing methods. For example, until 2002/03, and in an effort to avoid excessive seabird bycatch, the Australian Government only permitted Australian fishers to use demersal trawling in the toothfish fisheries (AFMA 2003a, b, c).³⁴⁷ Moreover, some licensed fishers support trawling and recommend further research to assess the relative merits of using mid-water and demersal trawl nets (Australia 2005b). For them, mid-water trawl nets sit on the ocean surface for up to half a kilometre and significant numbers of seabirds are killed when they dive into the large and loosely woven mesh at the front of the net because they are unable to see it (800-4,000 millimetre mesh sizes for up to 300 metres); whereas, demersal trawl nets sit on the ocean surface for approximately 100 metres and can be retrieved quickly (Australia 2005b).³⁴⁸

Carrying sufficient numbers of scientific observers onboard all toothfish fishing vessels (as part of the observer scheme) is another action proposed by respondents that could be extended to change long-held fishing practises and monitor the success of new procedures and technologies. For example, Respondent 49 states that CCAMLR scientific observers have been invaluable in conducting research into the fisheries, reducing scientific uncertainty and identifying gaps in the data because they are able to talk directly to the fishers and provide them with information; relay industry information back to CCAMLR members; and foster cooperation between the fishing industry and government authorities (Section 3.5.3). However, despite the measurable success of the scheme, Respondent 70 refers to dishonest fishers and observers onboard the Uruguayan-flagged longliner *Viarsa 1* to illustrate that IUU fishers often factor the

³⁴⁶ Twenty-three ENGOs form the DSCC and include: Greenpeace, IUCN, Natural Resources Defense Council, Oceana, Pew Charitable Trusts and WWF (see ECBP 2004).

³⁴⁷ To minimise environmental impacts on benthic habitat and assist escapement of juvenile target species and other bycatch, the Australian Government imposes trawl gear restrictions on trawl bobbin and mesh sizes. In addition, the Australian Government has since approved the use of longlining for the HIMI fishery based on the successful trialling of IW longlines in 2003 (AAD 2004d).

³⁴⁸ Respondent 56 also states that “thousands of seabirds ... in a trail up to five kilometres long” follow Chilean factory trawlers and “become tangled in the trawl nets ... or in the wires.”

costs of employing observers into their operations and that fishery observers can be corrupted (Section 5.3.3). Therefore, she warns that although the scheme has potential to monitor the toothfish fisheries and is successful in principle, its practical implementation in some cases has been lacking. In this vein, Sabourenkov and Miller (2004: 76) also point out that flag State prosecutions for breaches reported by scientific observers under the scheme have “never been large”, for Rayfuse (1998: 604) it “is not perfect”, and Rothwell (1998: 20) states that the quality of enforcement is questionable because the “system is not very binding.” The conduct of scientific observers in the *CCAMLR Sub-network* illustrates their capacity to monitor and change the behaviour of other actor-networks for the common good both locally and at a distance. However, their conduct can also be influenced by self-interested motivations or the ability of more powerful actor-networks to manipulate their behaviour and convince them to act in a fraudulent manner.

9.5.2 Marine protected areas

ASOC, Greenpeace and the IUCN propose that a marine protected area (MPA) be established around Antarctica given that it is a World Park and the Madrid Protocol designates Antarctica as a natural reserve dedicated to peace and science (Respondents 36, and 41).³⁴⁹ ASOC observers also urged CCAMLR members at the twenty-third CCAMLR meeting in 2004 to endorse the calls from the CBD and UN General Assembly to establish MPAs in the Convention Area to protect vulnerable deep-sea habitats, including seamounts, and other vulnerable ecosystems (ASOC 2004c).³⁵⁰ The IUCN (1988 Resolution GA 17.38) defines a MPA as:

Any area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment.

However, the philosophy of ANT suggests that the concept of MPAs remain problematic because these spaces are physically bounded by humans and embody social subjectivity (see Murdoch 1997a). In this respect, nature is bounded as certain delimited geographical territory where anthropogenic environmental politics seek to stabilise the actor-network. However, humans are unable to restrict dynamic and complex marine ecosystems. This implies that marine spaces cannot, and perhaps ought not, be restricted if its habitats and associated and dependant species are to naturally and socially flourish (Section 2.2.2). Accordingly, it also implies that all the connections (whether they are inside or outside MPAs) that holds marine habitats and associated and dependant species in the actor-network give practical and moral content to the concepts of resilient ecosystems, sustainable fish stocks and responsible fishing.

³⁴⁹ See also Kelleher (1999), Kelleher *et al.* (1995) and Kimball (2004).

³⁵⁰ Deep-sea fisheries, IUU fishing and the establishment of MPAs to protect vulnerable ecosystems were discussed at the first meeting of the UNICPOLOS in May/June 2000 (UNICPOLOS 2000).

Nonetheless, CCAMLR members consider that establishing an adequate and representative system of MPAs in the Southern Ocean is an important action to protect vulnerable toothfish stocks and reduce biological uncertainty associated with the capacity of these stocks to maintain their biomass.³⁵¹ For example, Respondent 49 states that MPAs in the Convention Area “appear inevitable in some form or another” and CCAMLR already has some MPAs in place in respect to areas that are closed to fishing (Table 3.1).³⁵² As such, CCAMLR members endorse the advice provided by the SC-CCAMLR arising from the 2005 *Workshop on Marine Protected Areas* held in Silver Spring, the United States, at the twenty-fourth CCAMLR meeting in 2005 (CCAMLR 2005d Paragraphs 3.51 to 3.65; CCAMLR XXIV 2005g §4.12-§4.18; CCAMLR 2005i). At the Workshop, participants sanctioned the IUCN’s definition of MPAs, and CCAMLR members agreed that a strategic and harmonised approach to a system of MPAs is needed because they hold considerable potential for furthering the objectives of the Convention on the Conservation of Antarctic Marine Living Resources, particularly with regard to Article II.³⁵³ CCAMLR members also identified that under the IUCN categories of protected areas, the Convention Area qualifies as Category IV (Habitat/Species Management Area: protected area managed mainly for conservation through management intervention) to ensure maintenance of habitats and/or to meet requirements of specific species such as the toothfish. Although CCAMLR members have yet to develop MPAs, they recommend that the SC-CCAMLR determine a broad-scale bioregionalisation of the Southern Ocean, fine-scale subdivision of biogeographic provinces and possible MPAs.

Only 11 per cent of respondents comment on the establishment of MPAs in the Convention Area, and fishers and industry operators are silent on this action (Figures 8.2, 8.3 and 8.4). Respondent 18 refers to South Africa’s intention to establish a MPA around the PEMI to 12 nautical miles to protect the area’s biological diversity including the Patagonian toothfish (see South Africa 2005). In addition, the intended Anvers Island Antarctic Specially Managed Area (ASMA) in the Antarctic Peninsula area will include a large marine component to balance science, tourism and fishing interests, and the Balleny Islands MPA in the Ross Sea seeks to protect krill and toothfish stocks (CCAMLR 2005i). In October 2002, the Australian Government also declared the HIMI Marine Reserve to protect HIMI World Heritage-listed islands, the territorial sea, an

³⁵¹ Since the designation of the first MPA in 1938, known as the Green Island Marine Park off the coast of Queensland, Australia, significant advances have been made in MPA development (Kriwoken *et al.* 2006). These developments include the Global Representative System of Marine Protected Areas, which promotes the recommendations of the 1992 *Fourth World Congress on National Parks and Protected Areas* call for 10 per cent of each biome of the world to be included in protected areas (IUCN 1992).

³⁵² Kimball (2003) also suggests that although closed areas and seasons are a normal feature of fisheries management, MPAs can act as an insurance policy for fisheries, allowing damaged fish stocks to rebuild.

³⁵³ There has also been debate within ATCM and CCAMLR over the roles and responsibilities of the ATCM, CEP and CCAMLR and if, in relation to MPAs, these responsibilities are complementary or overlap (CCAMLR-XXIV 2005g; Respondents 34 and 39).

MPA and the adjacent HIMI maritime zone (AAD 2005b).³⁵⁴ However, some licensed fishers question the motives of those establishing MPAs. For example, Respondent 6 considers that the HIMI Marine Reserve is “irrelevant” because the “Patagonian toothfish are not found within the protected zone.” He states that it is unlikely that governments will establish MPAs in areas where prime commercial fisheries are found.³⁵⁵ Despite this respondent’s concerns, in 2003, delegates to the fifth IUCN World Parks Congress held in Durban, South Africa, set a target of protecting representative networks of MPAs that comprise 20 to 30 per cent of every marine habitat by 2012 to restore marine ecosystems and protect the oceans from over-fishing (see IUCN 2003b).³⁵⁶ In addition, government officials, scientists and ENGO campaigners recognise the urgent need to establish MPAs in areas beyond national jurisdiction and that effective compliance is needed to monitor these areas (see Balmford *et al.* 2004; Gubbay 2005; IMPAC 2005; IUCN 2004; Kelleher 2003; Respondents 25, 49 and 52). Unfortunately, CCAMLR members and coastal States in the Southern Hemisphere have a long way to go in meeting these targets, especially considering that of the 5,000 or so MPAs globally, less than one per cent of marine habitats are protected and at the current rate of progress, a 20 per cent target will not be achieved until 2085 (see Radford 2004; Young & Randerson 2005).

8.6 Observations

Given that the Southern Ocean has a strong geographical focus with its vast area, many respondents highlight that conversation, cooperation and building capacity between all actor-networks are necessary if national and high seas toothfish stocks are to be managed sustainably and IUU activities are to be curbed. For them, fishers, CCAMLR members, other governments and their authorities and committees, scientists, IGOs and NGOs and their representatives, traders, consumers and the wider community need to cast the net widely to enrol, convince and capture other actor-networks in the *Patagonian Toothfish Network*. State and non-state actor-networks also need to work together and mobilise new forms of knowledge and expertise, and various technologies and inscriptions, in an effort to change cultural and social practises that negatively pressure the toothfish and to support action for the collective good. In this light, cultural change is needed not only within CCAMLR itself, but also at the national level for both member States and other non-complying States, and at regional and local levels to mobilise fishers and the general public in the management debate and to reform and secure CCAMLR mechanisms themselves. For example, some respondents call for

³⁵⁴ The MPA is the world’s largest fully protected marine reserve covering an area of 65,000 square kilometres (AAD 2005b). It is classified as an IUCN Category 1a *Strict Nature Reserve* and is managed primarily for scientific research or environmental monitoring.

³⁵⁵ Mangel (2000: 547) also points out that although there is strong evidence suggesting that MPAs achieve environmental benefits within their geographic region, there is weaker demonstration of benefits (e.g. to fisheries) outside these protected areas.”

³⁵⁶ Balmford *et al.* (2004: 1) estimate that a global MPA actor-network covering 20 to 30 per cent of the world’s oceans might cost between US\$5 to US\$19 billion per year to run.

fishers to balance outdated misconceptions that are increasingly socially unacceptable (such as believing that they have a *right* to fish the oceans unconditionally and protect their commercial interests at all cost) and embrace sustainable fishing practises, precautionary catch limits and codes of conduct. Some respondents also propose that the global community manage toothfish stocks as natural ecosystem FSUs rather than stocks that occur discreetly in socially delimited areas such as national maritime waters, the Convention Area or specific areas on the high seas.

Respondents emphasise that it is not possible to solve all the problems impacting upon the toothfish fisheries instantly, but suggest how it is possible to connect with certain actor-networks to change parts of the problem by incrementally building responsible fishing practises and changing cultural and social norms through adaptive management. Here, adaptive management involves mobilising intermediaries through chains of translation. In particular, respondents identify that direct national and international intervention is required to manage and conserve toothfish stocks in a sustainable manner in the form of ongoing mitigation and punitive arrangements to ensure that IUU operators comply with conservation measures and regulatory controls. They also advocate that CCAMLR members work with like-minded States that are committed to conserving the toothfish fisheries. In this respect, they suggest that like-minded States establish bilateral and multinational agreements to provide participating States with the ability and authority to act at a distance to monitor and regulate larger marine areas, reduce the cost (and increase the frequency) of patrol operations, and facilitate information exchange. In addition, bilateral and multinational agreements are put forward by many respondents as mechanisms to enable States to pursue collaboratively IUU operators regardless of where they might reside or base their operations.

Chapter 9

Trade Control

9.1 Introduction

This chapter focuses on the fifth principal strategy where the majority of respondents support strategies to control market activities that complement CCAMLR conservation measures (Figure 8.1). Like DeSombre (2005) and Hatcher (2004), many respondents identify that certain actor-networks (such as third parties to the Convention on the Conservation of Antarctic Marine Living Resources, FOC vessels or traders selling illicit Patagonian and Antarctic toothfish products) act in a dissident manner, and are willing and able to avoid international rules. They also note that collective international moral and legal action that excludes rogue operators from the benefits of acting illegally by barring them from the marketplace is one approach to improve global regulatory efforts to sustainably manage the toothfish. Choquet (2003) also argues that effective trade measures are needed to control economic and especially consumer demand. In addition, delegates attending the 2002 INDNR/IUU stated there “is no doubt that if the countries [sic] that receive IUU fishery products had effective mechanisms to prevent the products from being sold, the incentive to practice IUU fishing would disappear ... responsible fishing should go hand in hand with responsible trade” (MAPA 2002: no page).

In particular, this chapter explores the ability of state and non-state actors to mobilise power and influence various actor-networks in the *Patagonian Toothfish Network* by enrolling market-based controls to manage Patagonian toothfish stocks in a sustainable manner. In this sense, the actor-network has mutated and reconvened actors around a powerful *Toothfish Market Sub-network* that is able to translate new forms of wisdom and knowledge. Here, various hidden actor-networks, and market-centred issues and actions, have become more visible over the past five years as the actor-network has become more complex. This discussion highlights a gradual transformation from State power focused on sovereign control and scientifically-based ecosystem management to a new form of governance that encompasses market-based incentives and mechanisms aimed at transforming behaviours (see Mansfield 2004; Shell International Limited 2005). Given the power of economic forces to influence various actor-networks and impact upon the sustainability of the toothfish, non-state actor-networks are also intervening in, and manipulating, action to conserve the toothfish by mobilising market actions (see Cole 2003). These actor-networks have sought to *unpack* the toothfish market and identify certain nodes of power in the actor-network in an effort to pressure other actor-networks to take action to stop trade in IUU toothfish products.

9.2 State actor-networks strive to control trade

Given the increasing demand for (and high value of) Patagonian and Antarctic toothfish products, CCAMLR members have implemented conservation measures including the CDS, cVMS and observer scheme to monitor toothfish fishing activities, identify the source and legitimacy of the catch and subsequently, control trade. National governments have also tightened trade rules and enacted laws to regulate toothfish trade. However, despite widespread support for these actions by stakeholders involved in the legitimately licensed toothfish fishery, significant shortcomings in these mechanisms and toothfish trade data generally make it very difficult to assess the extent of both legitimately and illegally traded toothfish products. In this respect, respondents consider how state actor-networks might improve their performances in monitoring and regulating the toothfish market and combating IUU trade activities by mobilising a range of international regimes and mechanisms that act at a distance and across jurisdictional boundaries.

9.2.1 CCAMLR members monitor trade activities

To support strategies to control market activities, respondents praise the efforts of CCAMLR members with respect to developing CCAMLR conservation measures, including the CDS, cVMS and observer scheme, which aim to remove IUU toothfish products from the marketplace. For example, Respondent 52 states that it is “remarkable that the CDS was implemented in only two years” and Respondent 36 suggests that “the CDS is a good start to helping stop IUU fish trade.” The CDS was adopted by CCAMLR members in 1999, and it has attracted increasing support since its operation in 2000 (see Agnew 2000; Sabourenkov & Miller 2004) (Section 3.5.3).³⁵⁷ The scheme amalgamates a catch certification with a trade documentation scheme and has two main objectives.³⁵⁸ These are to track landings and world trade in toothfish caught inside and outside the Convention Area and to restrict the sale of IUU toothfish products taken in the Convention Area in international markets. For Miller *et al.* (2004: 337), “the most pervasive feature of the CDS is that it allows estimation of ‘total’ toothfish removals, which is essential for stock assessment purposes.” Sabourenkov and Miller (2004) consider the scheme has been successful in extending its overall coverage to more than 90 per cent of the global trade in toothfish and it appears to have reduced the levels of IUU fishing in the Convention Area.³⁵⁹ For Respondent 61, it is “one important mechanism to help stop IUU activities” although Respondent 2 is more cautious and considers that “the CDS is possibly effective.” Therefore, the CDS is not a stand-alone

³⁵⁷ The IPOA-IUU also provides several diplomatic and legal measures to diminish IUU trading and urges all States to adopt appropriate measures in a timely manner (FAO 2001a).

³⁵⁸ Catch certifications are issued at the point of harvesting; whereas trade documentations are established by RFMOs and accompany fish products (see FAO 2002c; Sabourenkov & Miller 2004).

³⁵⁹ Most CCAMLR members engaged in toothfish trade have implemented the CDS. Three non-Contracting Parties: the People’s Republic of China, Seychelles and Singapore; along with three Acceding States: Canada, Mauritius and Peru have implemented the CDS (CCAMLR XXIV 2005g).

measure but an integral component of a *toolbox* of interconnected measures (including the cVMS and observer scheme) to combat IUU fishing.

ENGO respondents support the CDS although they remain critical about loopholes in the scheme that allow IUU operators to continue their activities (see also Stokke & Vidas 2004). For example, Respondents 25 and 52 refer to the Convention on the Conservation of Antarctic Marine Living Resources not applying to non-signatory States and allowing Parties to opt-out of trade-related conservation measures within 90 days of agreement (CCAMLR Convention 1980 Article IX6(c)). They discuss how the CDS can be manipulated by various actor-networks that are distant from one another because it is started by fishing captains, completed by export customs officials and checked by importing customs officials.³⁶⁰ These problems of governing at a distance can occur at many nodes in the *Toothfish Market Sub-network* and result in misinformation or corruption (see, for example: Dean 1999; Holm 2001; Murdoch 2000; Rose & Jones 2004). For example, IUU fishers' can tamper with monitoring procedures, observers have been corrupted, and documentation can be copied or falsified; particularly when FOC States issue valid documentation for IUU catches, toothfish caught inside the Convention Area is misreported as being harvested outside the Convention Area, and matching sets of documentation are forwarded for different trans-shipment loads (see also Bialek 2003; Gianni & Simpson 2004; 2005). In addition, the CDS is unable to identify fish that have been incorrectly declared as another species and approximately 10 to 15 per cent of catch passes through the scheme through this confusion (Respondent 49). When confusion occurs, toothfish is not investigated and once trans-shipped at-sea and offloaded at port, CCAMLR has no knowledge of these catches (see ASOC 2004d; Gianni & Simpson 2005; NET 2004c, d). Solutions to reduce loopholes include the trial of the eCDS since 2003³⁶¹ and the adoption of the tamper-proof, satellite-based cVMS in 2004 to stop fraudulent documents from being submitted to CCAMLR (Section 3.5.3). Some licensed fishers also urge CCAMLR members to refuse catch documents if toothfish has been trans-shipped at-sea because this practise may propagate fraudulent documentation. They also urge CCAMLR members to not publish the position, route, speed, and direction of fishing vessels in the Southern Ocean monitored via the cVMS because this information is valuable to IUU operators (Respondents 4 and 11).

This discussion illustrates that although the CCAMLR CDS, cVMS and observer scheme have been designed to prevent the trade of illegally caught toothfish, they remain problematic because IUU operators have been able to harness any weaknesses in

³⁶⁰ For CCAMLR (2004e), monitoring the State of origin of toothfish products is difficult and the reported flag, port and export States recorded on a CDS document is often different (CCAMLR 2004e).

³⁶¹ At CCAMLR XXII in 2003, the eCDS was considered "the way of the future" by some CCAMLR members and its trial period was extended during 2004 and 2005 to allow participants to become more familiar with the system (CCAMLR XXII 2003a; 2005g). While implementation of an eCDS was not adopted at CCAMLR XXIV in 2005, CCAMLR members continue to support the measure.

these actor-networks to their advantage. Therefore, many respondents recommend that the CDS and cVMS be improved to remove loopholes; CDS documents be verified independently to ensure their validity; the observer scheme be expanded; and all States work cooperatively to stop IUU trade activities. For Sabourenkov and Miller (2004), the future success of the CDS (and other measures) may lie in the market price of toothfish products that carry CDS documentation because they attract prices that are a third to a half higher than products without documentation.

Respondents also suggest that trade in toothfish is tacit and causes significant shortcomings in toothfish trade data, making it very difficult to assess the extent of both legitimately and illegally traded toothfish.³⁶² For example, market uncertainties associated with the sale of toothfish products include traders hiding operations behind ghost trading companies, and confusion that stems from tracking toothfish products as they are exported and imported to multiple States before reaching consumers (ASOC 2004d; NET 2004a, c; Sabourenkov & Miller 2004). Other market uncertainties are exacerbated by the many names, products and codes by which toothfish is traded and incomplete datasets on which to base management decisions (Section 5.4). Uncertainty also arises when toothfish products are recorded under different names or as a part of a group of other fish species through misidentification, misreporting and double-counting of fish products as they move through the trade cycle. In addition, conversion factors do not account for processing details of toothfish in sufficient detail to convert traded fish to live weight in an accurate manner. For example, toothfish cheek meat, collars and heads are usually reported in trade statistics as toothfish *other* and could be mistakenly recorded as cutlets or fillets (CCAMLR 2004e). With these issues in mind, CCAMLR members acknowledge that information on the trade in toothfish products is insufficient and monitoring market activities is paramount (CCAMLR 2004e).³⁶³

To reduce trade uncertainties, some respondents call for analysis to be urgently completed to determine how much toothfish is traded internationally, what proportion of trade comprises IUU catch, and what products consumers do, or seek to, purchase. Although an analytical procedure has yet to be developed and implemented, in the 2004/05 intersessional CCAMLR period CCAMLR members actively monitored toothfish trade activities (including catch, landings, exports and imports). However, they “found that it is an inordinately difficult task” due to the secretive nature of the industry and because analysing economic activities is not in CCAMLR’s traditional remit (Respondent 49). CCAMLR members have also found that, despite having access to the Fish Information and Services (FIS) seafood trade data,³⁶⁴ using import and

³⁶² Among the major trading nations, toothfish trade data on *frozen fillets* and *frozen other* are available for Australia, Canada, Chile, EU members, Japan and the United States (TRAFFIC 2001a; Fallon & Stratford 2003a). *Frozen other* includes the headed and gutted product together with all other forms apart from fillets. Canada and the United States also identify a category of *fresh fish*.

³⁶³ CCAMLR members also note that prior to the CDS, State import and export trade figures were the main indicators of the overall volume, trade routes and markets for toothfish products (CCAMLR 2004e).

³⁶⁴ Established in 1995, FIS provides a key standard for global seafood industry information (FIS 2005).

export trade figures from State customs organisations is problematic because the figures are different from one another. Nonetheless, Respondent 65 argues that using State trade codes and publicly available customs data to track the *Toothfish Market Sub-network* is important because they are often the only data available.

In light of the market uncertainties described above, and in order to detect trade in particular toothfish products, Respondents 25 and 69 call for more data to provide a comprehensive overview of toothfish markets and headings in the World Customs Organisation's (WCO) harmonised system for tariff classification to uniformly identify toothfish products.³⁶⁵ For them, effective, connected and harmonised tariffs codes are important because export and import data can be used to map an actor-network of those who invest, harvest, process, market, distribute, trade and consume legitimate and illegal toothfish products. Respondent 69 also recommends that CDS data be more transparent, publicly available and presented in a consistent format that allows for accurate and independent trade analysis. This would ensure that the findings put forward by other organisations (such as TRAFFIC) who do have access to this information are not undermined by CCAMLR members. This point illustrates that CCAMLR members resist conceding authority to other actor-networks in relation to toothfish trade data despite their more recent entry into this debate. At the same time, CCAMLR members recommend that "shortcomings in current trade statistics need to be fully taken into account" and they should be compared from a number of sources including national and international catch statistics, CDS data and monitoring of IUU vessels (CCAMLR 2004e: 10).

9.2.2 National governments tighten trade rules

Since the early-1990s, many CCAMLR members have developed national fishing regulations to promote legal harvesting and trade, sustainable fishing practices and ongoing livelihoods for those engaged in the toothfish industry. For example, five years after first being advocated by ISOFISH, the *Royal Decree 1134/2002, on Application of Fisheries Sanctions to Spanish Nationals on Board of FOC Vessels* entered into force in November 2002 (Respondent 33). This new regulation develops a number of provisions of the Spanish *National Maritime Fisheries Act (Ley 3/2001)* on issues related to the involvement of Spanish nationals in IUU fishing. According to Fallon and Kriwoken (2004: 247), it is "now a violation of Spanish fisheries law to act inconsistently with the obligations established by international fisheries agreements, treaties or conventions; or to land, trans-ship or import into the Spanish territory any catch from vessels that have been identified as IUU vessels." Thus, the Royal Decree allows action to be "taken against Spanish citizens found to be involved in, or with, IUU fishing activities, under quite broad circumstances" (COLTO 2003c: 4). Despite this commitment, the Spanish

³⁶⁵ Established in 1952, the WCO is used by over 140 States, accounts for over 90 per cent of world trade, promotes legitimate international trade, and supports action against illegal trade activities and the harmonisation of simplified and effective customs systems (WCO 2005).

Government has yet to bring an action against a Spanish national in breach of the legislation (*Mercopress.com* 2004a). This outcome brings into question the effectiveness of national policies, laws and regulations to regulate trade activities if governments are unable or unwilling to enforce them.

Nonetheless, the United States Government has taken a lead in curbing illegal trade of toothfish products within its borders. In May 2000, the United States National Oceanic and Atmospheric Administration (NOAA), and the National Marine Fisheries Service (NMFS) took aggressive actions to prevent illegally caught toothfish being imported into the United States (ASOC 2002b). They adopted new rules on the import of Patagonian toothfish into the United States (*SeaWeb* 2000). These rules require that, within 24 hours of delivery to United States traders, importers send catch documents to the NMFS verifying that the fish were caught outside the Convention Area, or that they were harvested within the Convention Area *and* in conformity with CCAMLR conservation measures (Agnew 2000). The United States Government strengthened this requirement at the twenty-first CCAMLR meeting in 2002, and announced changes to its domestic Import/Export Control Program (regulation NOAA03-047). From December 2002, the United States Government prohibited the import of toothfish caught outside the Convention Area in unregulated waters of FAO Statistical Areas 51 and 57 (ASOC 2002b; Fallon & Kriwoken 2004). During the same year, the United States Government urged consumers to make a conscious choice about purchasing legitimately caught fish (United States 2002). Respondent 4 notes that despite these measures, the toothfish industry “sometimes learns that the United States ... market is depressed.” This is because large quantities of toothfish have been imported despite NOAA’s aggressive actions to prevent IUU toothfish imports. He questions whether sufficient quantities of legitimately caught toothfish could have supported the market.

In an effort to reduce IUU imports into the United States, the NMFS completed its first prosecution under this CDS in 2003 when the United States and South African governments investigated the activities of a South African based fishing company, Hout Bay Fishing Industries Pty Ltd (HBFI).³⁶⁶ Known as the *Bengis Case*, the United States Customs Authorities, the South African Directorate of Special Operations (the *Scorpions*) and South African Department of Marine and Coastal Management conducted a three-year investigation into the activities of HBFI that resulted in one of the largest international sanctions for fishing offences to date. HBFI and three affiliated companies operating in the United States, Icebrand Seafood Inc., Associated Seafisheries Inc. and Icebrand Seafoods Maine Inc., engaged in an elaborate scheme to

³⁶⁶ Mr Lawrence Lasarow from Seaport Management Services LLC was not required to complete an EIA prior to fishing for toothfish as required under United States fisheries law, and was a member of the United States CCAMLR delegation in 2003/04 (Respondents 44 and 65). Lasarow was also caught illegally importing toothfish into the United States during 2003/04. As part of his plea bargain, the United States Government deployed his fishing vessels *American Warrior* and *America 1* into the toothfish fisheries to allow authorities to employ scientific observers free-of-charge (Gianni & Simpson 2005).

export illegally and trade South African rock lobster (*Jasus lalandii*) and Patagonian toothfish between 1987 and 2001 (NET 2004c; *News24.com* 2003a; TRAFFIC 2004).

Initially, Mr Arnold Bengis, once a leading benefactor of the South African Jewish community (Schoonakker 2003) and highly respected Managing Director of HBFI, pleaded guilty to charges that this company contravened the South African *Marine Living Resources Act* (18 of 1998) in April 2002 (*Dispatch Online.com* 2002; FMNH 2004; Gosling 2004c; Hutchison 2004; Miller *et al.* 2004). Bengis and his co-conspirators were accused of under-reporting fish harvests to the South African authorities, bribing fisheries inspectors and submitting false export documents (TRAFFIC 2004). The landmark case attracted front page media attention in the *Cape Times* after the South African Department of Marine and Coastal Management seized a container of illegally harvested South African rock lobster tails and Patagonian toothfish that Bengis was trying to export to the United States in May 2001 (*Dispatch Online.com* 2002; Gosling 2004c). Bengis admitted to authorities that between 1999 and 2001, HBFI knowingly and intentionally participated in the over-fishing of South African rock lobster but also South African hake (*Merluccias capensis*). The total penalty imposed by the South African Court on the company, in terms of a plea bargain, amounted to R40 million [US\$5.9 million] and the contents of the refrigerated container (worth approximately R8 million [US\$1.24 million]), and the fishing vessel *Sandalene* (worth approximately R3 million [US\$466,000]) were also forfeited. According to TRAFFIC (2002), this occasion was the first on which the extensive powers contained in the *Marine Living Resources Act* (18 of 1998) had been invoked in full. However, Bengis was never formally charged in South Africa.³⁶⁷

Given that Bengis has dual South African and United States citizenship, after the South African Government closed down his operations in South Africa and *allowed* him to leave the country, he moved to the United States. According to Respondent 49, after a three-year joint investigation by the South African and United States authorities, he was then arrested in the United States in August 2003 when he was unable to present CCAMLR CDS documents to authorities in the United States verifying the legitimacy of the Patagonian toothfish catch (worth approximately US\$383,000). He was subsequently charged under the United States *Lacey Act* for smuggling South African rock lobsters and Patagonian toothfish from South Africa into the United States through HBFI and the American fishing companies, which were under his executive control (Gosling 2003; *News24.com* 2003a).

³⁶⁷ Although Bengis maintained that HBFI could defend the case, a company director pleaded guilty to 301 charges of corruption relating to bribing fishery inspectors and HBFI paid R40 million (approximately US\$6.22 million) in full settlement of the charges (*Dispatch Online.com* 2002).

The *Lacey Act*, as amended in 1981, makes it a crime for any person to import and transport wildlife caught in violation of foreign or state law into the United States.³⁶⁸ Under the *Lacey Act*, Bengis and four co-conspirators were indicted to the United States District Court in Manhattan, New York.³⁶⁹ Bengis and two of the co-conspirators were subsequently found guilty in May 2004.³⁷⁰ They were fined heavily for smuggling South African rock lobsters and Patagonian toothfish into the United States for at least 15 years, bribing South African fisheries inspectors and lying about their fishing operations (United States 2004). The United States Government has since tracked down most of the profits made by Bengis laundered through banks in the United States, Gibraltar, Jersey Islands, Switzerland and the United Kingdom (Respondent 49), and the South African Government is re-instituting personal tax evasion and exchange control regulations to recover money (Gosling 2004).³⁷¹

This precedent might influence the global IUU fishing industry in the future because it involved a successful international investigation that led to the arrest and conviction of fishers who were conducting illegal activities across a number of jurisdictions. It also provides an excellent example of the ratcheting-up of enforcement measures in response to IUU fishing. The failure of HBFI to supply CCAMLR CDS documentation and the application of universal banking laws and associated legislation were used to recover a significant amount of money that was used for, or gained from, nefarious purposes by Bengis and his co-conspirators.

Respondent 65 suggests this case (and other retrospective measures in general) “will have a chilling effect on people who will think twice before they engage in IUU activities.” Although there is always a danger that arrests, court outcomes and other administrative actions may not significantly reduce the overall IUU fishing effort because activities might be potentially *shifted* elsewhere. If these actions change the perceptions that conducting IUU fishing activities is a crime in the international arena, this alone is a positive measurable outcome (Respondents 44, 49, 50 and 65).

9.2.3 CITES Appendix II listing

The helpfulness of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in regulating trade in toothfish products has been the subject of heated debate. CITES is a multilateral agreement that forms its own IGO actor-network, which currently comprises 167 members. It was established as a result of

³⁶⁸ The *Lacey Act* can only be used to enforce measures that are reflected in national laws and regulations and it is essential to prove an underlying violation of a foreign law (HSTF 2006).

³⁶⁹ Indictment, United States of America v. *Arnold Maurice Bengis, Jefferey Noll, Grant Berman, David Bengis and Shaun Levy*, United States District Court, South District of New York, 2003.

³⁷⁰ The men faced 21 counts, including conspiracy to violate the *Lacey Act* (see Gosling 2004c; United States 2004). Bengis was sentenced to 46 months imprisonment and fines of US\$5 million and US\$15 million in asset forfeiture were imposed.

³⁷¹ The international war on terror has also tightened up universal banking laws and it is now more difficult for illegal operators to launder their monies.

a resolution of the IUCN and came into force in 1975 to protect flora and fauna species that are threatened with extinction, or are likely to be so (CITES 1975; 2005). It lists approximately 5,000 animal species and 25,000 plant species,³⁷² and “regulates international trade through a system of permits and certificates that are required for export, re-export and import of wildlife and wildlife products” (Cox *et al.* 1999: 4). The CITES Secretariat also plays an enforcement role and works closely with the WCO, INTERPOL, national enforcement authorities and NGOs (such as TRAFFIC) to track trade in listed species and to document discrepancies in trade statistics (Kimball 2003). The CITES Conference of the Parties (COP) reviews threatened species lists and trade statistics, and draws attention to illegal trade. Trade is permitted for species listed on Appendix II of CITES when the proposed trade is judged to be non-detrimental to the existence of the species.

Given that trade measures adopted by CCAMLR members only apply to CCAMLR Parties, 20 per cent of respondents suggest that CITES offers a greater scope to regulate toothfish trade because its large membership offers greater coverage (Figures 8.2, 8.3 and 8.4). Although 44 per cent of NGO respondents champion such action, only a limited number of respondents are supportive. The implication here is that actor-networks with the greatest capacity to exert power in CITES appear to be those who back this action most strongly. ENGOs and Australian toothfish fishers extended the actor-network when they lobbied the Australian Government to nominate the Patagonian toothfish for listing under CITES Appendix II in 1998 (see ASOC 2002c; HSI 2002b; TRAFFIC and WWF 2002; Willock 2002). Austral Fisheries Pty Ltd joined with WWF, Greenpeace, HSI, ISOFISH (when it was active), NET and TRAFFIC (with the endorsement of ASIC) to protect toothfish when urging the Australian Government to propose the CITES listing of the Patagonian toothfish at the 2002 CITES COP12 meeting in Chile. Respondent 52 describes this partnership as an “unprecedented success.”

However, the Australian Government proposal attracted considerable opposition from the majority of CCAMLR members in 2002 at the twenty-first CCAMLR meeting. They considered that the CITES nomination could potentially undermine the CDS, give rise to confusing overlap in documentary and administrative trade requirements and, more generally, erode CCAMLR’s competency in relation to its international status as the RFMO responsible for managing Antarctic marine living resources (see Bialek 2003; CCAMLR XXI 2002c; Molenaar 2004; Sabourenkov & Miller 2004; Stokke & Vidas 2004; WWF 2002). CCAMLR members remained concerned despite the provision in CITES Article XIV that states that the regime shall not affect the right of Parties to adopt stricter domestic measures regarding the trade of specimens and shall in no way affect the obligations of Parties to another regime (such as the Convention on the Conservation of Antarctic Marine Living Resources) to abide by measures relating

³⁷² Species may be listed under Appendix I, II or III depending on how threatened they are by trade.

to the trade of specimens (CITES 1973 Article XIV). They also argued that the nomination would do little to stop IUU activities given that CITES Article XXIII Paragraph 2 offers an escape clause that allows for Parties to take out a specific reservation on specific measures, thereby avoiding their obligations to abide by the measure (CCAMLR XXI 2002c; CITES 1973). They criticised the Australian delegation for pushing its own self-interested agenda, placing too many issues generally on the agenda at CCAMLR XXI and distracting other CCAMLR members with the CITES nomination (Respondents 29, 55 and 57). As such, the Australian Government and CITES were considered dissident actor-networks because CCAMLR members perceived that the CITES listing might reduce the influence of CCAMLR and its members to exert power in toothfish trade related fora. The actions of CCAMLR members suggest that they resist conceding authority to CITES (and by inference, other IGOs).

In addition, the proposal was not supported by the required two-thirds majority of CITES members in 2002 at the CITES COP12 Meeting. However, ENGOs and the Australian Government continued to work with the Chilean Government on the wording of Chile's proposal for a Resolution of Cooperation between CCAMLR and CITES. The successful CITES COP12 Resolution was unanimously endorsed by CITES members at the same meeting, and it helped to ensure that IUU fishing remained under consideration (Austral Fisheries Pty Ltd 2002; CITES 1999; Fallon & Kriwoken 2004; Stone 2002b; TRAFFIC & WWF 2002). The Resolution requires CITES Parties to use the CCAMLR CDS, to report on the use and verification of the CDS to CITES and CCAMLR, and to report on the use of verification regimes. Notably, Respondent 49 maintains that "there is cooperation at the institutional level" between CCAMLR and CITES. Unfortunately, little progress has been made on cooperation between CITES and CCAMLR since 2002, although the CCAMLR Executive Secretary has indicated that matters of mutual interest between the two regimes will continue to be reviewed (CCAMLR XXIV 2005g §15.19).

CITES Appendix II listing for the Patagonian toothfish is also problematic in other ways. For example, CITES manages species not stocks and most of the listing criteria have been developed for endangered land-based species (Cox *et al.* 1999). There are no specific criteria for marine species nor has it been used to control trade in a high value migratory marine species like the Patagonian toothfish. Consequently, Respondent 49 considers that CITES is too general and cannot be applied to the specific issues pertaining to managing and conserving toothfish stocks and considerable uncertainty remains about implementing CITES provisions for such a species. In particular, if one or more stocks were healthy, listing the entire species may be too general a tool (Molenaar 2004). In addition, there is uncertainty about the interpretation of the non-detrimental requirements for a commercial marine species and about how the *introduction of the sea* provisions, which apply to CITES Appendix I and II, may be

implemented given that they define how CITES members regulate fishing activity in international waters (CITES 1973 Article I (e)).³⁷³ Under CITES, the Management Authority of the State into which a catch is landed must act on the advice of the Scientific Authority of the State and issue a certificate of introduction before the introduction takes place advising “that the introduction will not be detrimental to the survival of the species involved” (CITES 1973 Article III 5(a) and Article IV 6(a)). Since much of the Patagonian toothfish catch is taken on the high seas, how these provisions are interpreted and implemented is particularly important given that any associated certificates do not require that the *specimen* was legally obtained (see TRAFFIC & WWF 2004). In addition, CITES members are unable to regulate domestic trade and, therefore, IUU toothfish products can be sold unimpeded by IUU operators domestically within their flag State. Nor does CITES apply to non-Party States, and although some CITES members that have reportedly been involved in IUU toothfish activities could be compelled to comply, other States allegedly involved in similar activities (such as Angola, Bosnia-Herzegovina, Georgia, Madagascar, St. Vincent & Grenadines and Togo) are not members and less accountable (Table 5.2).

Nonetheless, ENGO respondents generally support CITES Appendix II listing for the Patagonian toothfish, question the views of CCAMLR members in relation to CITES undermining the competence of the Convention on the Conservation of Antarctic Marine Living Resources, and consider that the failure of CITES members to list this species was an opportunity missed for both CITES and CCAMLR members. For example, Respondent 44 argues that the CITES listing “would complement, not challenge, CCAMLR ... It could take CCAMLR’s rules and regulations and extend them to a significant number of other countries that do not participate in CCAMLR.” Respondent 65 also states that CCAMLR members would continue to manage the Patagonian toothfish fisheries, but CITES could provide additional expertise relating to tracking international trade in wildlife and enforcement capabilities. For those respondents, fishing States (such as Japan and Norway) that oppose any commercial marine fish being listed on any CITES Appendices are self-interested, dominate debates within CITES meetings, generate an element of *unproductive frenzy* between CITES members and stifle initiatives to protect marine living resources. Other ENGO respondents suggest that CITES listing provides a mechanism for unilateral action against IUU toothfish operators and provides a precedent for RFMOs that have similar problems to consider other complementary measures to help protect their own fisheries. However, other ENGO respondents question whether CITES listing would help ensure toothfish stock preservation, although it has been a helpful educative strategy to raise community awareness (Respondents 36 and 69). Despite these reservations, Lutchman (2005: 12) states that CCAMLR:

³⁷³ This provision is the “transportation into a State of specimens of any species which were taken in the marine environment not under the jurisdiction of any State” (CITES 1973 Article I (e)).

... still cautions about cooperating with international organisations and multilateral environmental agreements such as CITES towards collaborative actions to address its problems ... In 2030, it is important that CCAMLR is viewed for its success in ecosystem management in real terms and not seen as just another RFMO concerned with reactive management to resource exploitation.

The salience of this debate is that rather than CCAMLR members fearing the erosion of CCAMLR as an important head-actor-network in the *CCAMLR Sub-network*, CCAMLR may increase its influence and power, and stabilise its position by working with others in the *Patagonian Toothfish Network* to protect the Patagonian toothfish.

9.2.4 World Trade Organisation

The actions of the World Trade Organisation (WTO) and its members to support or hinder the efforts of other actor-networks in regulating toothfish trade and stop IUU toothfish activities is tacit. Established in 1995, the WTO has emerged as one of the key IGOs of global governance in the international political economy (Cole 2003; Williams & Ford 1999). As successor to the General Agreement on Tariffs and Trade (GATT), the WTO and its 148 members have widened and extended global regulation of international trade and payments (WTO 2005a).³⁷⁴ As an organisation, the WTO has formed actor-networks and developed a rules-based approach to international trade that comprises a mosaic of rules, norms and principles to govern the global trading system; a forum for multilateral trade negotiations; and a centre for dispute settlement. In particular, discussions on the interrelationship between trade and the environment occur in the Committee on Trade and Environment (CTE) (WTO 2004; 2005e).³⁷⁵ Although some WTO members allegedly been involved in IUU toothfish activities could be held more accountable, other States reportedly involved in similar activities (such as Equatorial Guinea, Sao Tomé and Príncipe, Seychelles, Ukraine and Vanuatu) hold only observer government status and are even less accountable (Table 5.2).

The CCAMLR Secretariat extended the *CCAMLR Sub-network* and wider *Patagonian Toothfish Network* when it actively lobbied the WTO and submitted background information to the CTE on CCAMLR conservation measures to stop IUU fishing and the implementation of the CDS (see Bialek 2003; Molenaar 2003; Sabourenkov & Miller 2004). At interview, some scientists and researchers commend these developments and recommend WTO reforms to combat IUU trade activities. For

³⁷⁴ The GATT contained the guiding principles upon which the world trading system is based (GATT 1994). It consisted essentially of tariff-cutting and required that no differentiation occur between domestic and imported products (see Wessels 1999). Under the GATT, States do not have the sovereign right to use unilateral trade regulations to compel other States to comply with domestic regulations or boycott specific fishing methods or activities that might interfere with a species international trade (see Litfin 1998).

³⁷⁵ The CTE is composed of all WTO members and IGO observers, and brings environmental and sustainable development issues into more general WTO fora (WTO 2005d). Its mandate includes identifying relationships between trade and sustainable development; making appropriate recommendations to the WTO; and assessing rules and surveillance to enhance the interaction between trade and environment including avoidance of protectionist measures (Williams & Ford 1999).

example, Respondent 28 proposes that the WTO sanction illegal trade, but acknowledges that how that might be achieved is yet to be determined, and its mechanisms are slow and unable to impact on IUU activities conducted by non-member States and operators without nationality or able to corrupt vulnerable States. Respondent 61 also explains that WTO rules-based international trade standards fail to incorporate sustainability principles, and are unable to act against rapid and uncontrolled trade activities (see also Cole 2003). In addition to trade sanctions, Respondent 61 recommends that WTO members develop core rules-based environmental standards that apply environmental sanctions to curb IUU trade activities; and impose retrospective tax measures to impound the assets of those found to be acting illegally (Section 8.2.2). For him, “the WTO-type rules-based approach holds ... promise to help stop illegal trade and encourage sustainable fisheries management” given that “no strong international law to stop illegal trade of toothfish” presently exists (Respondent 61). Paradoxically, States that apply domestic trade conditions that incorporate sustainability principles can be in breach of WTO rules.

However, the WTO maintains that it “is not an environmental protection agency and that it does not aspire to become one” (WTO 2004: 16). It also asserts that trade liberalisation is not the primary cause of environmental degradation and trade instruments are not the first-best policy for addressing environmental problems (WTO 2003). In short, the WTO does not consider it has the answer to environmental problems, and advocates that trade and environmental policies can complement each other. Nonetheless, WTO members do acknowledge that the world’s fisheries are confronted with an unprecedented crisis of depletion, the urgency of achieving sustainable development in the fisheries sector, the detrimental effects of IUU fishing, and the need to reduce subsidies and fishing capacity (WTO 2001 Doha Declaration Paragraph 28). In striking a balance between safeguarding market access and protecting the environment generally, the 1994 Marrakesh Declaration and 2001 Doha Declaration advocate that environmental measures (such as a trade control scheme) need to be consistent with WTO rules, remove trade restrictions and distortions, be inclusive and transparent, take into account the capabilities of developing States, and meet the legitimate objectives of the importing States (WTO 1994 Marrakesh Declaration Item 6; WTO 2001 Doha Declaration Paragraph 32(i)); WTO 2003). Notably, the Marrakesh Declaration squeezes the toothfish market debate through its own OPP when deploying the rhetoric of sustainability and the precautionary principle to protect and preserve the environment. For example, the WTO (1994: no page) states:

... there should not be, nor need be, any policy contradiction between upholding and safeguarding an open, non-discriminatory and equitable multilateral trading system on the one hand, and acting for the protection of the environment, and the promotion of sustainable development on the other.

The Doha Declaration reaffirms this OPP and the commitment of WTO members to environmental protection by instructing the CTE to give particular attention to the effect

of environmental measures on market access. It also affirms finding win-win-win solutions for trade, the environment and human development, and supporting the 2002 United Nations *World Summit on Sustainable Development* (WSSD) in its call for voluntary, WTO-compatible market-based expansion of domestic and international markets for goods that are environmentally friendly.³⁷⁶ In addition, the Declaration supports the negotiation of non-discriminatory multilateral environmental agreements (MEAs) (such as CITES provisions and the CCAMLR CDS)³⁷⁷ to address trans-boundary global problems. Other WTO agendas include the development of the Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement relating to the transfer of environmentally friendly technology in support of MEAs and environmental protection; and non-discriminatory, voluntary and market-based eco-labelling for environmental purposes (WTO 2005b, c). For Schorr (2004: 1), implementing these declarations is critical for ensuring the sustainability of the world's fish stocks and assessing the ability of WTO members to "live up to the balanced promises of its charter." WTO agendas are important because the trade issues that WTO members seek to control are those that potentially drive over-capacity in the toothfish fishing industry, and intensify problems associated with the crisis of over-exploited world fish stocks.

Actions of WTO members have been a particular focus for national governments, scientists and NGO groups because they have become increasingly concerned about the trans-boundary nature of environmental degradation exacerbated through world trade (see Chaves 2000; MAPA 2002; Schorr 2004). In the WTO, environmental issues are tied of the extension of free trade principles and the global economy to global governance. In this regard, the increased scope, performance and rule-making authority of the WTO has "alarmed environmentalists and other civil society actors who fear that the organisation and control of vital national decisions have been gradually and irretrievably displaced from national control to a supranational organisation shrouded in secrecy" (Williams & Ford 1999: 273). Therefore, the ability of ENGOs to influence the world trade agenda through the WTO is constrained by its system of rules and their exclusion from its closed operating structure (Murphy 2005). In this sense, the WTO is elevated as a head-actor-network by its members and it aggressively exerts power in the *Toothfish Market Sub-network* to retain control over world trade and exclude other actor-networks who might question or compromise its authority.

³⁷⁶ The WSSD was held in Johannesburg, South Africa in September 2002 (UN 2002a). It considered sustainable development principles and practical ways to achieve progress in the new global society. WSSD participants adopted a neological position that combined ecology and economy, where sustainable development integrated environmental stewardship, and environmental and social development. However, Respondent 26 considers that the WSSD discussions failed to commit to sustainable development objectives. For example, the WSSD contains time-bound commitments with respect to protecting marine living resources and aims to maintain stocks that can produce MSY. Nonetheless, WSSD participants remained committed to eliminating IUU fishing by 2004 (see Pallemarts 2003).

³⁷⁷ All CITES regulations are WTO compliant. The CCAMLR CDS is also consistent with the provisions of the WTO because all three key elements of the WTO principles are addressed including: non-discrimination between CCAMLR and non-CCAMLR Parties; transparency in multilateral resolution; and clear linkages to conserving a resource (Agnew 2000; Sabourenkov & Miller 2004).

Despite the WTO's closed operating structure, ENGOs have lobbied the WTO since the early-1990s, with varying degrees of success by using engagement and rejection strategies and intermediary actor-networks presenting position papers and attending WTO ministerial conferences as observers or actively protesting against the WTO in the media (He & Murphy 2005; Murphy 2005; Williams & Ford 1999).³⁷⁸ They have engaged in political debate to shift the trade paradigm so that environmental issues are inscribed in trade negotiations, and actively lobbied and influenced debate within the WTO for increased transparency, participation and accountability. In particular, ENGOs are critical about the WTO's lack of accountability to national governments, and the shifting of environmental issues from the WTO to the CTE because the narrowness of the CTE's agenda has resulted in the Committee's failure to ensure sustainable development by fostering sustainable trading practises and MEAs (Catarci 2004). In addition, there have been no cases brought to the Dispute Settlement Body (DSB) of the WTO against any trade measures aimed at conserving natural resources (ICFA 2003). Notably, Schorr (2004) writes of the *thin green line* between trade and environmental issues, and the need for WTO members to reduce fishing subsidies and forbid harmful fishing subsidiaries, taking into account the needs of developing States. He also advocates finding other win-win-win solutions that do not overstep the "boundary between the WTO's legitimate competence and its counterproductive entanglement in questions of fisheries policy" (Schorr 2004: xiv). This commentator is critical of the inability of WTO members to achieve any significant win-win-win outcomes to date because they have "primarily focused on promoting the interests of export-oriented industries, particularly in the major industrialised countries" and remain a long way from fulfilling their balanced promises of the WTO charter (Schorr 2004: 17-18).

Consequently, the relationship between trade and environment is contested in both domestic and international politics. The ability of non-state actor-networks to challenge the WTO or world trade rules that fail to conserve the toothfish is constrained by the secret and closed nature of this organisation and the discourse of free trade. In addition, the application of trade measures to encourage compliance with MEAs related to fisheries within the WTO is complex given the globalisation of fish trade. However, if core environmental standards are to be established for the toothfish, Respondents 26, 28, 49 and 61 recommend the development of sanctions for both illegal trade and poor environmental performance, and the application of trade measures to all LOSC Parties given that they should cooperate with each other in the conservation and management of high seas living resources regardless of their RFMO status (see LOSC 1982 Article 118). They urge CCAMLR members to improve cooperation between CCAMLR and the WTO and to develop a connected and harmonised customs code for toothfish products (see CCAMLR 2003d). When taking into account the capabilities of

³⁷⁸ Although NGOs are excluded from WTO deliberations, the WTO Secretariat makes some concessions and maintains informal relations with them in accordance with the 1996 *Guidelines for Arrangement on Relations with Non-government Organisations* (WT/L/162) (Williams & Ford 1999).

developing States and fair trade, Respondent 26 recommends that the OECD *Ministerially-led High Seas Task Force on IUU Fishing* or WSSD process consider issues of inequity that drive IUU toothfish activities, seek to protect developing States' interests, and provide a way forward for the WTO on these matters.

9.3 Non-state actor-networks support trade focused campaigns

Since 2000, actions to control trade in Patagonian and Antarctic toothfish and their products have been initiated by non-state actor-networks who form part of the *global civil society*, and act at a distance and beyond the State. These actions have extended the *Toothfish Market Sub-network* and underpinned the work of ENGOs and INGOs. These organisations have largely focused on mobilising *technologies of communication* to provide consumers with sufficient knowledge to identify sustainably caught toothfish and their products in the marketplace.

Respondents recommend specific market controls and trade certification to regulate toothfish trade and consumption because they may be powerful mechanisms to help manage the fisheries in a sustainable manner (Figures 8.2, 8.3 and 8.4). For example, ENGOs advocate changing market-based cultural practices by changing consumer demand. For example, since the release of internationally respected TRAFFIC trade reports, and given the growing concern among traders and consumers as to the environmental *friendliness* of the toothfish they purchase, many ENGOs are informing traders and the general public about purchasing sustainably harvested toothfish and the benefits of making environmentally responsible purchasing decisions to their lifestyle and the environment (Animal Welfare Institute 2001; Mascoli 2004; McCosker 2002).³⁷⁹ In this sense, ENGOs are being re-enrolled in various market actor-networks, and reconfiguring how they exert power by transforming moral discourses and shaping the conduct of individuals to change their own behaviour, monitor their own risks and self-govern (see Dean 1999; Eckerberg and Joas 2004). From running consumer boycotts and ranked lists to teaming up with celebrity chefs, ENGOs based mainly in the United States have tried different strategies to link localised toothfish consumption to conservation outcomes elsewhere, and to empower hidden consumers to pass through their own OPPs by making choices about the toothfish products they purchase. Considering that the United States is possibly the largest consumer toothfish market, their efforts could potentially influence consumer choices in a large section of the international marketplace (Section 5.4). According to Helvarg (2004), consumer campaigns originated with the successful consumer boycott of tuna in 1990, which called for only dolphin-friendly tuna products to be sold internationally and resulted in dolphin-safe labelling on tuna products (Section 6.2). Respondent 41 also identifies that market-based toothfish campaigns have resulted in measurable support and success. For

³⁷⁹ Other ENGO trade reports include: Cascorbi (2002); Gianni & Simpson (2004; 2005); Fallon & Stratford (2003a, b); Lack (2001); Lack & Sant (2001); NET (2004c); Willock (2002; 2004).

example, ENGO pressure directed towards the United States Government resulted in the administration taking more decisive steps to ban IUU toothfish imports and a more active rôle in CCAMLR (Section 9.2.2).

9.3.1 Toothfish moratorium and consumer boycotts

Initially, ENGOs such as ASOC and Greenpeace called for an international *Toothfish Moratorium* on all toothfish fishing and a consumer boycott on toothfish products in 1998 (ASOC 1998; Greenpeace 2000a, b). The moratorium and boycott were implemented as a campaign strategy in the United States where consumers were encouraged to stop purchasing all toothfish products in an effort to reduce economic demand for toothfish and spur toothfish fishers generally to lobby governments to take action. ENGOs argued that because the legitimately licensed fishery provides a shadow under which illegal fishers operate, all toothfish products should be removed from the global marketplace to reveal IUU activities because products that continued to be traded would be illicit (ASOC 2001c). Overall, only 38 per cent of NGO representatives and 17 per cent of officials and fishery managers support this strategy (Figures 8.3 and 8.4). Nonetheless, Respondent 25 thinks that the strategy should remain in place until IUU fishing is stopped, adequate stocks assessments are completed, an independently verified and harmonised trade system is introduced, and incidental bycatch is constrained or eliminated. In her words:

You can't take away the stick just because someone is willing to give you a good word ... You need implementation ... To me you can't just drop the call for something until you actually achieve something. You need to maintain the pressure until you have achieved a result.

NET widened the constituency of interest in the *Toothfish Market Sub-network* when it launched the *Take a Pass on Chilean Sea Bass* campaign in early 2001 and more than 60 restaurants agreed to remove Patagonian toothfish from their menus (Section 6.3.8). Between 700 and 1,000 chefs (reportedly worldwide but most likely to be mainly in the United States) were captured in the actor-network when they agreed to stop serving toothfish until the stocks recovered (Daspin 2004; National Geographic 2002). Overall, the campaign encouraged consumers to boycott all Patagonian toothfish products at local markets. The Smithsonian Institution (2004) also reports that the China Wildlife Conservation Association (CWCA) has enlisted Chinese chefs to support Patagonian toothfish conservation efforts in 2004 by endorsing a campaign to stop cooking wild species entitled *No Cooking Precious, Rare Wildlife*. According to the Smithsonian, CWCA hopes to mobilise more than three million Chinese chefs and eight million professional cooks to sign onto the campaign. This may be a potentially important awareness-raising strategy considering that East Asian toothfish markets (including the Chinese market) are increasing (Section 5.4).

Although largely hidden actions in this study, actor-networks from the commercial food industry have also come together regionally in the United States to promote the interconnectedness of the environment and food choices, and educate and inspire restaurateurs and chefs to make environmentally sound purchasing decisions. One such actor-network is the Chefs Collaborative that was established in 1993 and has more than 1,000 members who encourage sustainable practices in the food industry (Chefs Collaborative 2004; Middendorf 2001). In addition, over 100 of the world's top celebrity chefs, operating under the name StarChefs, have also developed a *Sustainable Seafood Guide* that can be accessed via an Internet website for educating chefs to make *conservation-minded* choices by not serving Patagonian toothfish (Lewy 2004).³⁸⁰ NET and the Conservation Action Network have also campaigned directly against fish traders in the United States. For example, they campaigned against Joe's Grocery Stores to pressure that trader to stop selling illicit toothfish products (Conservation Action Network 2004; NET 2003; 2004b; Endangered Fish Alliance 2004).³⁸¹

9.3.2 Ranked lists

Despite initial resistance from the fishing industry, the labelling of *sustainable seafood* is becoming increasingly popular and many ENGOs, again based in the United States, have published guides to assist consumer choice (Helvarg 2004). They hope to utilise hidden market forces by mobilising technologies of agency and performance to reward the sustainable practices of *good* fishers and discredit the destructive practices of *bad* fishers. For Brownstein *et al.* (2003: no page):

Demonstrating that not all seafood is equal has proven an excellent way to start a discussion with audiences who do not identify themselves as conservationists. By giving people options they can act on, we've helped build a wider constituency [network] for ocean conservation.

For example, in 2001 the Audubon Society, through its Living Oceans Program, first published a small, pocket-sized *Seafood Wallet Card* (that can be accessed via an Internet website and used on-the-spot) to help traders, restaurateurs, chefs and consumers identify potentially threatened fish species and select fish that have been harvested from sustainable fisheries (Audubon Society 2004; Lee 2001). The card ranks 30 popular seafood species into a colour-bar scale of green (abundant, well-managed), yellow (some concerns about fishing methods and management) and red (significant problems, best avoided). The Patagonian toothfish is listed in the red range as the second most endangered species on the card (Audubon Society 2001; 2005). Environmental Defense has also published a pocket-sized *eco-best* and *eco-worst* list known as the *Environmental Defense Seafood Selector* to help consumers purchase fish that are "healthy for our oceans and ... our diets in terms of toxins or pollutants"

³⁸⁰ The Canadian Endangered Fish Alliance (including restaurateurs, chefs and conservationists) also encourages its members to not serve Patagonian toothfish (Endangered Fish Alliance 2004).

³⁸¹ Established in 1958, Joe's Grocery Stores has over 200 stores (Joe's Grocery Stores 2005).

(Environmental Defense 2004: no page). In addition, Seafood Choices Alliance, an ocean communications and trade association; has published a *Fish List* that ranks sustainable seafood for purchase (Brownstein *et al.* 2003; Daspin 2004; Seafood Choices Alliance 2004). Moreover, MBA has developed a *Seafood Watch List* of best-choice seafoods and ones to avoid (Seafood Watch 2004; MBA 2005; Murphy 2004); the California Academy of Sciences has constructed the *Guilt-Free Gustatory Guide to Seafood* (McCosker 2002); and the Cyber Diver News Network provides a *Guide to Eco-friendly Fish Eating* (CDNN 2004). These communication actor-networks become visible through lists that rank the Patagonian toothfish as highly threatened. The lists can be accessed by other actor-networks at a distance on webs such as the Internet. With a focus on mobilising ranked lists, 69 per cent of ENGO respondents support using *technologies of communication* to connect effectively with actor-networks at a distance, whereas other respondents are silent on this action (Figures 8.3 and 8.4) (Section 7.4.3).

BOI also established the *From Sea to Table Program* in 2003 to evaluate fish and shellfish species that are most commonly consumed in the United States and develop a seafood ranking system to inform traders and consumers about making sustainable seafood purchasing choices (BOI 2004; 2005). Respondent 22 thinks that for species such as the Patagonian toothfish, BOI evaluates life history, abundance, habitat/gear impacts, management, and bycatch. As part of this study, I reviewed the current *Species Scorecard: Chilean Sea Bass* in June 2004 and again in August 2005, and my involvement in the review process illustrates how I am becoming increasingly mobilised into the actor-network (BOI 2004; 2005). After the review, a scoring system was used to generate a final score for the Patagonian toothfish, which indicated on a scale from green (sustainable) to red (unsustainable) that harvesting this species is not sustainable. The information is included on the *Guide to Ocean Friendly Seafood* Internet website and hardcopy *Seafood Miniguides* are available. Over 100,000 *Seafood Miniguides* were distributed in 2004 (Respondent 22).

According to Brownstein *et al.* (2003: no page) the ranking processes used by ENGOs in the seafood guides are “standardised, transparent, and updateable” and consumers have shown interest and willingness to act on the information they contain. Transparency has generated trust with the public, the scientific community, fishers and resource managers. In addition, because the guides can be accessed online, ENGOs are able to connect with hidden actor-networks globally, share research and scoring documentation, and respond immediately to inquiries. Although it is difficult to comment on the veracity or success of these lists, a number of respondents identify the BOI and MBA lists as being the most accurate and professional. The salience of this discussion is that once-hidden consumers can be captured in multiple ways in production-consumption actor-networks, and act locally and globally when making purchases (see Lockie 2002). For example, although the toothfish and its consumers are located at a distance to one another, through a chain of translation, the consumers are

able to enrol, convince and enlist reputable traders, restaurateurs and chefs to purchase toothfish products from reputable producers who in turn enrol, convince and enlist licensed fishers to extract the toothfish from the Southern Ocean in an environmentally sustainable manner.

However, the lists of sustainable, edible marine species are short and they are likely to become shorter if consumer demand influences fishers to catch ever increasing quantities of fish. In addition, more vulnerable species – such as the Patagonian toothfish – are likely to be targeted because they offer increasingly attractive returns as they become scarcer and more economically valuable. Furthermore, toothfish is an unusual fish product because it is mainly sold in hidden wholesale markets and restaurants rather than retail outlets (Respondents 40 and 69). Therefore, given that consumers may not be able to choose to purchase legitimately harvested toothfish, strategies aimed at educating restaurateurs and chefs to make environmentally sound purchasing decisions may provide a net by which to capture the environmentally responsible consumer market.

9.3.3 Criticisms of consumer campaigns

Some commentators are critical of the consumer campaigns advocated by ENGOs. Although Lassen (2001: 2)³⁸² acknowledges that the Patagonian toothfish has “a notorious unregulated fishery”, he also states:

The “ocean ecosystems are not in peril ... the overall global status of fisheries has remained stable for the past decade ... and as an advocate of environmental partnerships, it is difficult to recommend the use of seafood purchasing guides from environmental, aquarium and activist groups” (Lassen date unknown: 1).

For Hutchison (2004), moratoriums and consumer boycotts discriminate against licensed fishers who abide by fishery regulations, closes markets to licensed fishers and makes information on overall catch levels more difficult to obtain. Lassen (date unknown) also warns that *artistic* ranking lists and seafood guides often have weakly developed specification of the standards, are not based on science and the organisations who support them usually act both as the standard setter and assessor of the fishery. There is also no international consistency between the ranking systems and they often reflect the views of local ENGOs rather than international opinion.

For Martosko (2002: no page),³⁸³ consumers are “buying into environmental hype if they ban this fish [Patagonian toothfish] ... on here-say [sic].” In his words, tax-exempt ENGOs are able to influence public opinion and create an artificial demand for *eco-friendly* toothfish, which elite chefs serve to wealthy consumers in the name of *social*

³⁸² Thor Lassen is the President of the United States Ocean Trust Ocean Trust, a non-profit foundation working with seafood communities, scientists and local conservation groups on fisheries.

³⁸³ David Martosko is the Research Director at the Seattle Centre for Consumer Freedom, a United States coalition supported by restaurant operators, food and beverage companies and individuals.

consciousness. To support his claim, he refers to EcoFish, an American fish trader with the mission to promote ecologically responsible consumption of seafood (see Ecofish 2004). Martosko (2002) criticises fish traders, such as EcoFish, because they sell approved *eco-friendly* products and promise to donate part of their profits as charitable and tax-exempt gifts to ENGOs with their own politically driven agendas. For him, problems arise when fish traders and ENGOs are backed by wealthy and powerful foundations such as the Pew Charitable Trusts and Packard Foundation. He also criticises the considerable influence and power these trusts and foundations exert on other ENGOs in the United States. For example, the Pew Charitable Trusts has spent significant funds establishing and maintaining SeaWeb, the Audubon Society, Oceana and NET (Martosko 2002; TPCT 2004; Respondent 63). The Packard Foundation has also granted significant funding to ENGOs such as BOI, Environmental Defense, MBA, NET, SeaWeb and WWF (Packard Foundation 2004).³⁸⁴ In addition, Martosko (2002) is concerned that the Packard Foundation holds a permanent seat on the board of EcoFish and provided US\$1 million seed money to the MSC. Consequently, powerful industry groups with business or fishing industry interests that are hidden from the general public can possibly manipulate consumers through ENGOs such as NET promoting its *Take a Pass on Sea Bass* campaign, Ecofish creating an artificial demand for fish labelled as *eco-friendly* by this organisation, or the MSC certifying potentially threatened fisheries.

Specifically, 25 per cent of respondents do not support the ENGO call for a *Toothfish Moratorium* (Figures 8.2, 8.3 and 8.4). For Respondent 2, the ENGO push for a moratorium is “completely counter-productive”, Respondent 61 describes the moratorium as “unconstructive”, and Respondent 26 considers that ENGOs “have done more to damage the CCAMLR process” and the “reputation of ASOC” by their call for a moratorium. Respondent 26 adds that if the *Toothfish Moratorium* was advocated merely as a campaign strategy based on a moral discourse rather than scientific information, ASOC could be seen as being dishonest and disingenuous by other stakeholders because fishers have demonstrated their resolve to cooperate with ENGOs over large resources (see also Mitchell 1998; Respondent 39). For these respondents, if the toothfish is to be conserved, ENGOs need to develop a deeper understanding about the issues they canvas, promote respect, foster dialogue with all stakeholders and suggest solutions.

Some ASOC members (including WWF and HSI) and other ENGOs (such as TRAFFIC) also do not consider the *Toothfish Moratorium* or consumer boycott to be effective campaign strategies because they have the capacity to hinder other negotiations, particularly those with industry. These conflicting positions have caused friction within ENGO actor-networks (Respondents 52 and 69). Some ASOC campaigners also question its merit, although they have compromised their positions on occasion to present a unified voice. For example, Respondent 26 does not consider that

³⁸⁴ For example, the Pew Charitable Trusts has donated over US\$25 million to NET (Martosko 2002).

the United States consumer campaigns have “been particularly successful at a global level ... and they have been very hard to run” because the toothfish are not appealing and are difficult to sell to the general public in 10 to 30 second media grabs. Notably, Respondents 26, 36, 52 and 69 concur: if ENGOs can work past the call for a *Toothfish Moratorium*, there is significant scope for these groups, licensed fishers and governments to commit to the partnership approach and work together to develop toothfish management and conservation strategies (Section 8.3.1).

Licensed fishers do not support the *Toothfish Moratorium* or consumer boycott. Their unanimity highlights a concern over losing access rights to the toothfish fisheries and power in toothfish management fora. For example, Respondent 17 thinks that a moratorium will create an illegal “fishing paradise”, while Respondent 10 describes it as “unrealistic ... ill conceived ... ill informed” and views such bans as disadvantageous to licensed fishers. Furthermore, he suggests that such strategies play into the hands of IUU operators by providing them with open access to the resource: a point raised by 33 per cent of fishers and industry operators (Figures 5.7 and 5.8). In addition, Respondent 6 suggests that the “naïve and idealistic” views put forward by the “green” NGOs in their efforts to protect toothfish resources can often be counter-productive. Similarly, Respondent 18 warns that if licensed fishers were banned from the fisheries because of the impacts of IUU fishers, the former may robustly question the merits of fishing according to CCAMLR conservation measures and domestic requirements and choose to fish illegally. Such a possibility would mean that incentives to fish appropriately would be compromised. Indeed, it would be impossible for governments to develop suitable management plans in any locale if fishers are unwilling to comply with them. Many respondents from government also consider that the *Toothfish Moratorium* and consumer boycott are problematic because licensed fishers would be penalised and unable to access the fishing grounds, governments would not be kept informed about fishing activities by those legitimately accessing the fisheries, and IUU fishers could continue their activities with impunity (Respondents 29, 40, 55 and 57).

In balance of these views, Respondent 28 suggests that national governments are “not ready to take a major step forward in global governance” to protect the fisheries and that in the short-term, “non-state actors ... and efforts, like negative publicity and consumer boycotts, may be the best options [to stop IUU activities] if they can be mobilised on a global basis.” For him, any moratorium would need to have clear objectives and target toothfish trade, be applied with uniform scientific rigour, and not penalise licensed fishers. This discussion highlights that the *Toothfish Moratorium* and consumer boycott are less likely to succeed if they fail to mobilise scientific, government and industry support because governments and industry operators appear less willing to abide by collective decisions based on moral ideology, and are more likely to support action that reflects scientific and self-interested discourses (see Mitchell 1998; Sikkink 1993).

9.3.4 Trade certification

In an effort to pull the market away from IUU operators, 44 per cent of respondents recommend that education and information is needed to provide consumers with sufficient knowledge that enables them to purchase toothfish products verified as being from sustainably managed and legitimately licensed fisheries (Figures 8.2, 8.3 and 8.4). Considering that 69 per cent of NGO representatives but only 22 per cent of officials and fishery managers support this action, it appears that NGOs recognise the benefits of capturing consumers into the *Toothfish Market Sub-network* to instigate change at the local level whereas officials and fishery managers have yet to embrace this strategy. Licensed fishers also recommend that the legitimately licensed toothfish industry promote its products to consumers to ensure that they purchase sustainably harvested and traded toothfish because changing consumer perceptions heightens consumer sophistication when they know that their action in the marketplace supports sustainable fisheries (Respondents 4, 7 and 16).

Eco-labelling is considered by many respondents as one important intermediary mobile to differentiate between legitimate and illegal toothfish products. For example, the feasibility of a *branded* Patagonian toothfish is being investigated by COLTO members, and the MSC has developed a highly regarded eco-label for MSC certified fisheries (Sections 6.3.7 and 6.3.9). Indeed, the differentiation of legitimately caught toothfish products in the market, with the support of the MSC certification and CCAMLR CDS documentation, when coupled with effective monitoring and compliance of the fisheries, reduces the chances of fraudulent documentation and illegally caught fish entering the marketplace (Respondent 2, 10 and 35). There is also evidence that the sale of eco-branded toothfish products has resulted in IUU toothfish products becoming less profitable and selling for approximately 20 per cent less (Respondent 16). For Respondent 49, MSC certification as complementary to the CCAMLR CDS, although the individual certified fisheries may be perceived as being too specific and unable to take the ecosystem approach to management into account. In his words, MSC certification holds potential but remains problematic because despite MSC certification aiming to be non-discriminatory (especially with regard to WTO requirements), it may give wealthier States an unfair market advantage because they are more able to meet MSC certification standards. In addition, the MSC certification process is static and unable to incorporate new information, criteria set for some fisheries are more stringent than others, and measures for one fishery may be easier to apply than elsewhere. For example, the SGSSI Patagonian toothfish fishery certification was relatively easy to apply, although applying certification to the entire toothfish fishery would be difficult.

ASOC and NET, with the support of Greenpeace, the Natural Resources Defense Council and HSI (ENGOS based mainly in the United States), opposed the MSC certification of the SGSSI Patagonian toothfish fishery because some environmental concerns were not addressed by the assessors (Bruchmann 2004) (Section 6.3.7). The

certification caused many protests from ENGOs that supported the *Toothfish Moratorium* and questioned the eco-friendly guarantee of the MSC consumer eco-label (Baker 2004). In particular, ASOC and NET filed an objection to the certification citing their environmental concerns (Bruchmann 2004; Tarica 2004). For Gerald Leape, Vice President of Marine Conservation and NET, and a stakeholder council member of the MSC, “this fishery should never have even been considered for certification ... chain-of-custody alone is a potential Achilles heel preventing the consumer from ever really knowing if the MSC-labelled fish is truly legally caught” (Leape in Bruchmann 2004: 1). The chain-of-custody path is problematic because toothfish catches taken from the fisheries and transported from producers to traders and then consumers is difficult to verify, and at each stage legitimately and illegally harvested fish can be mixed together. Brown (2004) also contends that some ENGO campaigners think the MSC lacks credibility and is in danger of collapse unless drastically reformed, and its actor-network of members and expertise is widened. For example, TRAFFIC campaigners consider the integrity of the MSC process and the criteria that were used to assess the SGSSI Patagonian toothfish fishery needs review and adjustment because it is not possible to temper the application of objective criteria with subjective political judgements (Respondent 69). In addition, in view of the toothfish having been significantly impacted by IUU fishing, to certify one small and delimited part of the overall fishery around SGSSI may encourage IUU fishing because some operators might hide behind a *green shield* of MSC certification (Brown 2004).

In the report of the MSC Appeal and Objection Panel set up to review the ENGO objection, it was noted that while the panel dismissed some of the objections as unmerited, it found others to be legitimate (MSC 2005; Respondents 39 and 45). Consequently, the MSC Appeal and Objection Panel recommended that the MSC Certification Body impose new and revised conditions on the fishery to account for the nature of the stock and any potential ecological impacts on other species (Bruchmann 2004). After including such conditions in the *2004 Certification Report*, Moody Marine Ltd. recommended certification of the fishery under the MSC program for well-managed and sustainable fisheries for five years subject to annual audits to confirm that any required improvements are being undertaken (Moody Marine Ltd. 2004; Tarica 2004). In particular, the MSC eco-label can only be applied to certified and legitimately caught Patagonian toothfish from the SGSSI fishery.

The merits of eco-labels have also been contentiously debated in various IGO fora such as the OECD and WTO, and by national governments that consider they are potentially trade barriers in disguise (see Chaves 2000) or might generate additional production costs for licensed fishers without adding value (Lassen 2001; Respondent 17). Stokke and Vidas 2004: 26) also refer to the challenge that “lies in the diversity, complexity and length of the chains of custody associated with most seafood products” (such as MSC certification) and question if products carrying an eco-label actually originate in a

certified fishery. In addition, the WTO (2005c: no page) points out that “the assumption that labelling schemes have a positive effect on protecting the environment has been questioned by some.” The WTO also states that it has been difficult for the various organisations to agree on the criteria used in judging sustainable practices, whether the criteria are sufficiently scientifically-based or whether they meet the needs of self-interested parties to the consultation process. Moreover, it is yet to be determined whether voluntary NGO eco-labelling schemes (again like MSC certification) are consistent with WTO rules or whether any demand for certified products has been recorded (see FAO 2000; Hermes & Mikalen 1999; Kimball 2003; WTO 2004). However, eco-labelling schemes may have advantages because they are not associated with the WTO or affected by its rules due to their independence from national governments. Nonetheless, these commentators agree that eco-labelling schemes that are participatory, voluntary, non-discriminatory, scientifically rigorous, market-based and transparent are potentially efficient economic instruments to complement State regulation and inform consumers about environmentally friendly products. As eco-labelling becomes more successful, national governments may need to regulate these schemes to ensure their consistency and authenticity, and if it were proven that domestic and imported products are treated differently, WTO rules may subsequently apply (see Wessels 1999; WTO 2005b, c). In summary, toothfish certification and eco-labelling is a complex issue and tension exists between actor-networks regarding their relative merits. Even so, they provide potentially useful intermediaries to distinguish between legitimately and illegally harvested toothfish.

9.4 Observations

Using market power to increase stakeholder participation in the international regulation of the toothfish fisheries is an important mechanism to add to the *toolbox* of interconnected measures to curb IUU fishing and associated trade activities. Respondents emphasise the need for States to implement more accountable and transparent trading structures that are linked and *harmonised* internationally with other States' tariffs codes to ensure that toothfish products are sourced only from sustainably managed and legitimately licensed fisheries. However, constructing a *Toothfish Market Sub-network* that captures all actors and networks is difficult because traders and consumers are often hidden and constantly move in and out of the actor-network. Market data are also incomplete and there are significant inconsistencies between datasets. Therefore, many respondents recommend further research, more as a substitute to action, aimed at understanding the toothfish market and providing knowledge on which to base decisions.

In particular, CCAMLR conservation measures, including the CDS, cVMS and observer scheme, emerged in the *Toothfish Market Sub-network* as important mechanisms to monitor and regulate toothfish trade. Some respondents note that a number of CCAMLR Parties have already denied suspicious toothfish landings not carrying

appropriate CDS documentation, that the CDS has brought attention to fraudulent catch documentation and incidents of misconduct, and that illegally caught toothfish sold without CDS documentation is less profitable in the marketplace. However, they also point out that it is too early to assess the overall effectiveness of the CDS, and it remains to be determined whether it is an effective intermediary for curbing IUU activities or whether traders have reduced their demand for IUU-caught products (see Miller *et al.* 2004; Sabourenkov & Miller 2004). Consequently, respondents stress that for the CDS to be successful, remain dynamic and respond to changing circumstances, it needs international support, continued maintenance and evaluation.

This discussion underscores the point that CCAMLR conservation measures alone have not been effective in stopping IUU trade activities given the large number of disparate actor-networks in the *Toothfish Market Sub-network* that act in a dissident manner for personal gain. Dissident actor-networks are successful because they do not accept the scientific OPP established by CCAMLR members in relation to operating in accordance to trade-focused CCAMLR conservation measures. Alternatively, they manipulate leaky nodes in the actor-network that are materialised by loopholes in CCAMLR conservation measures, and destabilise this actor-network, the *CCAMLR Sub-network* and wider *Patagonian Toothfish Network*. In this light, managing the toothfish fisheries solely through scientific and self-interested discourses appears to be insufficient because it is also necessary to govern through the economy. Therefore, given that CITES and the WTO are international regimes that focus on regulating trade and, hold a greater number of States to account than CCAMLR, they offer potential scope to regulate toothfish markets and extend and stabilise the actor-network of regimes by creating additional OPPs that dissident actor-networks find more difficult to circumnavigate.

In addition, ENGO respondents draw on moral discourses and emphasise the importance of raising community awareness about only purchasing sustainably managed and legitimately caught toothfish products. Despite the criticisms against various consumer protection measures, the successes of ENGO consumer campaigns are arguably substantial, particularly in the United States where significant quantities of toothfish are traded to wealthy customers. As such, hidden or dissident actors, issues and actions have become more visible as the *Toothfish Market Sub-network* has become more complex. A niche market for sustainably harvested and traded seafood has emerged, as exemplified by the various seafood guides and ranked lists that are in circulation and publications that promote sustainable fisheries management. For Brownstein *et al.* (2003), these initiatives have created incentives for some fishers to improve their practices. Licensed fishers who were once critical of certification and eco-labelling schemes now recognise that economic advantages are possible if they differentiate their sustainably sourced toothfish products from IUU products. Therefore, licensed fishers are increasingly accepting the moral OPP established by NGOs with respect to the environmental imperative (and economic imperative) of harvesting

toothfish stocks from sustainably fisheries and mobilising professional eco-marketing approaches to identify legitimately caught toothfish products in the marketplace. For example, fishers are increasingly applying for MSC certification or developing their own eco-labels to increase their market power. However, one of the emerging questions for stakeholders is how to persuade toothfish traders to specialise in selling legitimately caught toothfish products sourced from fisheries that are sustainably managed.

Chapter 10

The Dynamic Actor-Network

10.1 International actor-networks of influence

Since the 1990s, the Patagonian toothfish has rapidly grown in importance in the *Patagonian Toothfish Network* as actor-networks formed connections with the fish to influence other actor-networks and exert power. This species has been reconstituted by various actor-networks from wild animals to an entity that is scaled, modelled and transformed into a fishery resource to be rationally managed and conserved. Because the Patagonian toothfish fishery is the most economically valuable and lucrative fishery kilo-by-kilo in the Southern Ocean, it has also transformed into a commodity that some actor-networks have heavily exploited in some regions. Much of the pressure on the stock has derived from IUU fishing. Notwithstanding the innovations introduced by CCAMLR members and national governments to institute a new nature and a new society to sustainably manage the fishery and influence fishers to modify their behaviour and adopt more environmentally responsible fishing practises, IUU fishing continues unabated. Indeed, Vidas (2005: 8) states the following:

[Despite] a decade of producing internationally agreed measures against IUU fishing ... after all these years and measures, we cannot see that IUU fishing is being significantly reduced; on the contrary, in some regions it is on the rise.

Therefore, the assessment reached by ENGOs, which was outlined in Chapter 1, estimating the commercial extinction for toothfish species at less than five years from 2002/03 emerges as plausible (see also Croxall & Nicol 2004; Kock *et al.* in press).

Although this study rested on a foundation that was based on traditional empirical methodological approaches to investigate IUU fishing as a practical problematic in the Patagonian toothfish fishery, it also sought to mobilise a theoretical perspective that was embodied by ANT in a new and innovative way. This approach guided the investigation in Chapter 2 to facilitate a fuller understanding about this fishery and the pressures that impact upon the sustainability of the stock. The ANT constructions provided an interpretative lens by which to descriptively illustrate how a heterogeneous array of human, nonhuman and inhuman actor-networks participate in a web of relations and are implicated in a socio-natural-material actor-network to influence the network that comprises Patagonian toothfish and each other. As such, I applied ANT to trace a complex, dynamic and unbounded *Patagonian Toothfish Network* and its multiple sub-networks, and described how the actor-networks are associated and connected with one another through knowledge and action. This approach provided a method to unpack the complexity of dynamics associated with the findings, analyse the actor-networks'

capacities to influence one another, interpret the views and opinions elicited from respondents, and describe the responses of particular actor-network groups.

Whilst the traditional empirical analyses of the problem of IUU fishing tended to focus upon somewhat pessimistic outcomes for the Patagonian toothfish, Examiner 2 suggests that the mobilisation of an ANT perspective allowed me to uncover the *tremendous changes* that the Patagonian toothfish has undergone over the previous 25 years. However, I argue that the traditional empirical analyses also uncovered these changes. Nonetheless, whereas the traditional empirical approach highlighted what is not working in the fishery, this new approach allowed me to uncover IUU fishing as an emerging technology for making visible and controlling some forms of fishing practices, which both negatively and positively influence the *Patagonian Toothfish Network*. In this way, ANT made a contribution to the study because it enabled me to see the various actor-networks in multiple ways and explore how they influenced one another. By unpacking some of the black boxes the traditional empirical approach tended to conceptualise from a negative perspective, ANT mobilised an alternative approach that encouraged different conclusions to emerge that were sometimes more buoyant or elastic.

However, applying ANT was a difficult task because this approach was overly complex and at risk of endless description that fluctuated between minute explanations of the particular and abstract generalisations, and some actor-network groups were easier to describe than others. Consequently, I also drew on insights from qualitative research, governmentality, models of organisation and general environmental management principles to speculate that state and non-state actor-networks target other actor-networks from a distance to encourage them to modify their behaviours by acting on their own conduct. Nonetheless, unresolved disjunctures emerged when attempting to combine these approaches with ANT because they have policy goals in mind and/or privilege certain forms of action, whereas ANT seeks only to describe the situation at hand. Other challenges arose in terms of validating my right to represent others. In addition, the *Patagonian Toothfish Network* is a construction within this dissertation and has no existence outside the text unless it is mobilised by other actor-networks. Despite these tensions, I sought to present the actor-network in an ethical, plausible and comprehensive manner by presenting *network truth* as I saw it.

With these reflections on methodology in mind, regional actor-networks within the international domain were described in Chapter 3. I explained that nonhuman actor-networks captured in the dynamic and unstable natural actor-network that embodies the *Southern Ocean Sub-network* act in a dissident manner by cutting across territorial and jurisdictional boundaries and overlapping international regimes, and by mobilising the forces of nature to hinder the efforts of other human actor-networks who seek to exploit, understand or manage them. However, the success of commercial fishing for the Patagonian toothfish from the mid-1980s marked the point at which the fish was

extracted from the *Southern Ocean Sub-network* and *punctuated* into a node that connected successfully with the *CCAMLR Sub-network*. The Patagonian toothfish underwent significant change from this time. It was reconstituted by various actor-networks from a wild animal to a fishery resource to be exploited, managed and conserved. I then outlined how convergent, international and institutional sub-networks, which include CCAMLR and national governments, manage and conserve the Southern Ocean resources and, specifically, the Patagonian toothfish from an ecosystem perspective. This approach transformed fisheries management in the sense that scientists determined how fish resources could be rationally utilised and governments exercised control over resource allocation. In an effort to act at a distance and exert power, these state actor-networks have enrolled various intermediary actor-networks in the *Patagonian Toothfish Network*. For example, scientists have transformed the fish into fish resources and then to places where management decisions are taken by mobilising measurement procedures, data collection, abstract models and maps. In addition, regimes and instruments of law have been increasingly mobilised by national governments in the wider regional actor-network of international regimes to transform power from governmental and judicial systems, which codifies and expresses the authority of CCAMLR and national governments, to instruments of normative order. They have also mobilised *technologies of communication* (for example: negotiations, principles, conservation measures, data, the Internet, media, reports and other literature) in chains of translation to extend information on the toothfish and enable social interactions to act at a distance and beyond State boundaries.

Chapter 4 unpacked the *Patagonian Toothfish Network* to reveal regional and national sub-networks that comprise CCAMLR-managed *new* and *exploratory* fisheries and coastal State fisheries where state actor-networks govern specific Patagonian toothfish populations from a single stock context. In this regard, I established the importance of questioning the traditional system of sovereignty and the law because certain actor-networks have allowed coastal States the right to superimpose mechanisms of discipline upon other actor-networks seeking to manage trans-boundary toothfish stocks that move across jurisdictional boundaries or fishers seeking to access the fisheries. For example, some coastal States (such as Argentina, Chile, France, South Africa and Uruguay) exert their sovereign rights, and tend to conceal the location of the toothfish fisheries and the procedures and techniques to manage the stocks under their jurisdiction by failing to disclose toothfish fishery information to other actor-networks. Although these States argue that obscuring the details on these fisheries offers the stock a measure of protection from IUU fishers, it also enables them to act in a self-interested and sometimes dissident manner with respect to other actor-networks. However, exclusive sovereignty is not a static principle but a historical institution, the norms and practices of which have changed over time in response to managing trans-boundary toothfish stocks and stopping trans-national crime associated with IUU activities that both move across increasingly permeable jurisdictional boundaries. Therefore, issues of

sovereignty remain problematic because political tensions exist between States seeking to manage national and/or high seas fisheries in the Southern Ocean and those actor-networks seeking to access the fish stocks. As a result, the actions of some coastal States have resulted in jurisdictional conflicts and instability in their own sub-networks and the *CCAMLR Sub-network*.

Dissident actor-networks were then described in Chapter 5. These non-state actor-networks are captured in a divergent and precarious *Dissident IUU Sub-network* of trans-national IUU fishers and traders that strive to remain hidden from other actor-networks. They fail to modify their own behaviour to manage and conserve toothfish stocks in a *sustainable manner* and act in a self-interested way to mutate powerfully the *Patagonian Toothfish Network*. In this respect, the links and modes that dissident actor-networks establish in the *Patagonian Toothfish Network* are unstable and uncertain because they choose to remain disconnected from other actor-networks. What emerges from this discussion is that IUU fishing is the single most important fishing practice that challenges the ecological, moral and legal norms held in certain actor-networks. However, IUU fishing also emerges as a technology for making visible and controlling some forms of fishing practices. For example, licensed fishers have become enmeshed in their own heterogeneous state- and non-state actor-networks as a result of their network-building activities with other *responsible* fishers and governments to promote sustainable fisheries management and stop IUU fishing activities. IUU fishing has also made visible various non-state actor-networks, which have been captured in a heterogeneous *NGO Sub-network* and anchored in a web of relations as a result of their efforts to stop IUU fishing and ensure that the toothfish fisheries are protected.

Specifically, the character and spheres of influence of key NGO groups were described in Chapter 6. Not only have these non-state actor-networks formed their own webs of varying stability, they are being re-enrolled in their own actor-networks and reconfiguring how they exert power within them. They have also established links with other actor-networks and extended the *Patagonian Toothfish Network*, are able to associate with other actor-networks that are local, distant or widely scattered, and have created new forms of governance and authority. In this regard, NGOs illustrate how transformations of authority and shifting patterns of power have led to disjunctures to State authority, and as a result, they shape perceptions, references and priorities on how the Patagonian toothfish is managed, conserved or protected.

The performances of many state and non-state actor-networks that strive to manage, conserve or protect the Patagonian toothfish are utopian because they presuppose a better world. Every theory, program, action or campaign they transform proposes an end of some kind: and the type of ecosystem, fishery, organisation, person, or society which is to be achieved. Notions of sustainably managed toothfish fisheries, ethical and proactive national governments, principled fishers and traders, active civil societies and informed and empowered consumers are examples of this idealism. However, the

actors' passage through the OPP of this study, their desire for the toothfish to multiply, the alliances and anchors they form for this to occur and their indispensable performances in the *Patagonian Toothfish Network* do not lead to a protected and utopian Southern Ocean marine ecosystem or sustainable toothfish fisheries. Sustainability is not achieved because the actor-networks have different motivations and behaviours that conflict with other actor-networks and, specifically, the toothfish's *goal* to remain in the ecosystem.

With these issues in mind, Chapter 7 focused on how power can be deployed and gives effect to elevating certain actor-networks who are able to influence others at a distance, but also how power imbalances are the result of processes of struggle that lead to contested performances between the actor-networks. Here, I established how underlying mentalities of governance and geopolitics conceptualise sustainability in the toothfish fisheries and underpin when, where and how the toothfish has been harvested, managed, conserved, protected or consumed. In addition, IUU fishing give practical and moral content to the concepts of sustainability and other management prescription such as precautionary decision-making and rational use. Moreover, the enduring influence of IUU operators to exert power in the actor-network illustrates that the process of transforming power is not only about enrolling alliances, but also about concealing alliances. For example, the collective voice of CCAMLR can also inadvertently hide the actions of some dissident members that continue to support IUU activities, and CCAMLR members can act in ways to protect their hidden national self-interests.

Therefore, the way in which power is distributed and the process of governing is deployed by CCAMLR (that strives to be an international head-actor-network) and national governments (that strive to be head-actor-networks of localised centres) remains uncertain because they are not utopian and require intentional or unintentional domination of other actor-networks. These forms of the *conduct of conduct* often necessitate the mobilisation of durable, fixed, irreversible and hierarchical relations of power that are often disputed and contested by other actor-networks (see Dean 1999; Foucault 1991; Murdoch 2000). In this vein, Callon (1986: 211) points out "no matter how constraining the device, no matter how convincing the argument, success is never assured" and *interessement* does not necessarily lead to alliances in actor-networks. The actions of CCAMLR and its members and national governments to capture actor-networks in the *Patagonian Toothfish Network* can never be assured, enrolment remains precarious and the links and nodes in the actor-network do not last by themselves: they need constant maintenance, work and the support of other links and nodes (see Law 1999a). This instability demonstrates that once the actor-network box is opened, sub-networks (including those that comprise CCAMLR, IGOs, national governments, scientists, NGOs, management committees and other fora) are complex, heterogeneous and dynamic, and cannot be fully black-boxed. Its existence suggests that the actor-networks that strive for head-actor-network status do not fully silence or speak for all

actor-networks that work outside specific clusters, and they are, therefore, never ultimate head-actor-networks. Consequently, there is no ultimate head-actor-network in the *Patagonian Toothfish Network*.

Nonetheless, the notion of government as the *conduct of conduct* infers that governments need societies if they are to govern, and those who are governed are empowered by the primary freedoms of acting and thinking. Governing risk by mobilising *technologies of performance* is central to the *Patagonian Toothfish Network* and it can be deployed from above (such as regulatory controls on fishing and trade) or generated from below (such as supporting certified fisheries or encouraging consumers to purchase sustainably caught fish). It also presupposes these freedoms and these capabilities among those who govern. However, CCAMLR and its members and national governments are complex, variable and not necessarily fixed, and they have different ways of presenting political, social and cultural truths. In addition, although the task of governing is traditionally bounded by space or sovereign territory, the actor-network connects multiple and heterogeneous actor-networks that are able to mobilise power outside this bounded space as free subjects. For example, fishers are being asked to exercise self-government where individual operators take responsibility for their actions. However, it is unlikely that self-management alone will effectively curb the activities of licensed or illegal fishers because their behaviour is a manifestation of the various levels of risk that exist in the actor-network and how these risks can be mobilised to their own advantage. Therefore, state actor-networks have needed to develop both conservation and punitive measures that cast a wide net in an effort to compel dissident fishers (and other actor-networks) to obey principles and regulatory measures. However, state actor-networks have also needed to devolve some of their power because other actor-networks have called for new forms of retribution and new types of social defences for the fisheries. In response, there has been a widening constituency of interest in the actor-network where state and non-state actor-networks have increasingly associated with one another and become more multiple, diffuse, facilitative and empowering in how they have engaged in the debate and developed management actions. Shifting patterns of power resulting from such re-alignments in the actor-network illustrate a transformation from State-led toothfish fisheries influence towards multi-level influences and action that involve both state and non-state actor-networks at the global, regional, national and local levels. The transformation also illustrates how the Westphalian system, which recognise autonomous States with sole and final authority over a delimited territorial space, has become contested in both practice and theory as a major impediment to international problem solving with regard to managing and conserving trans-boundary toothfish fisheries (see Brahm 2005; Cole 2003; Litfin 1988; Wapner 1998).

Notably, licensed and illegal fishers form very powerful actor-networks in the *Patagonian Toothfish Network*. However, not only do the crises in the toothfish

fisheries highlight significant challenges related to how to deal with over-capacity, licensed and illegal access to the fisheries and continuous pressure of the resource, they also highlight that the powerful role of scientists and the scientific outcomes they mobilise can also be problematic. Although science has the capacity to increase knowledge about the fisheries on which to base decisions, uncertainty remains about the fisheries and stock assessments continue to be contested between actor-networks. In addition, scientific outcomes can be politicised and manipulated by certain actor-networks to influence the way in which management decisions are made and hinder collective action against illegal fishers generally. CCAMLR and State authority and the authority of science are being increasingly challenged and toothfish fisheries management is now about choosing among alternatives including scientific uncertainty, precaution, economic and social drivers, and anecdotal and/or other information.

I explored the conditions under which state and non-state actor-networks have engaged new norms of action. For example, States and fishers have engaged in self-interested discourse that has led them to accept new norms when their own interests have been protected or when the power and interests of other actor-networks have forced them to accept such norms. At the same time, many actor-networks in the *Patagonian Toothfish Network* have accepted scientific discourse, and when they have supported scientifically-based fisheries conservation measures convergence in the actor-network has occurred. However, when scientific consensus has demonstrated the absence of environmental harm (such as assessing fisheries, setting TAC levels or advocating certain fishing practises) actor-networks have been more reluctant to support environmental protection measures and divergence in the actor-network has occurred. In addition, negotiations grounded in interest-based and casual belief-based discourse have also often depended on evidence where science is held as triumphant over other forms of knowledge. As such, the power of scientific discourse to influence behaviour depends on the expected response of the Southern Ocean ecosystem, the level of scientific consensus regarding the response, and the level of acceptance of that consensus by other actor-networks. However, negotiations grounded in a principled or moral discourse (often presented by NGOs) also depend on power. Where actor-networks have accepted new norms and modified their behaviour to manage toothfish stocks in a sustainable manner, they have internalised a commitment to the underlying moral principles and self-government. Without such a commitment, transforming action might only be induced through more direct and possibly material incentives linking these principles to material goals (see Mitchell 1998; Sikkink 1993).

This discussion highlights that the strategies and management-based actions outlined in Chapter 8 to re-align actor-networks in the *Patagonian Toothfish Network* and reconstitute new or improved actions to manage and conserve toothfish stocks and stop IUU fishing, are contingent on reconciling tensions that emerge from associating self-interested, scientific and moral discourses. For example, the precautionary principle and

ecosystem-based management that underpins the Convention on the Conservation of Antarctic Marine Living Resources illustrates the contingent relationship between policy, science and moral principles. How and whether actor-networks derive policy guidance from a particular set of causal beliefs and scientific evidence varies depending on their moral principles regarding the role of science and the relationship of humans to the Southern Ocean ecosystem and toothfish. Conflicts have centred on political and economic interests, scientific knowledge and normative values that include pushing national imperatives, SC-CCAMLR recommendations and rational use objectives. In addition, whilst licensed fishers recognise the intrinsic benefit of supporting sustainable fisheries management for the toothfish and ecosystem, they also use self-interested and scientific discourses to protect their commercial interests such as gaining exclusive access rights to the fisheries. Conversely, those who mobilise moral discourse (i.e. ENGO action) to protect toothfish stocks have proved less successful and caused instability in the actor-network because it has evoked resistance from other actor-networks that do not share the same moral values. However, transforming moral values may simply take longer to modify the behaviour of actor-networks than other forms of discourse. Consequently, mobilising moral norms to interrupt the actor-network and change the behaviour of actors and networks in ways that benefit the collective good may be influential over time.

In Chapter 9, I also underscored the point that ecological responses to protecting the Patagonian toothfish, have in part, been influenced by the international marketplace and the resistance by the *global civil society* to unregulated and unmonitored trade in toothfish products. To an extent, resistance by ENGOs has been about holding those with power in the global economy and/or States to account, democratising them, making them legitimise their actions and transforming their effects. Here, the globalised and valuable toothfish economy has intensified existing dynamics of capitalism and increased the distance between the ecosystem and producers and consumers. The globalised toothfish economy has also made it increasingly difficult for consumers to be aware of the ecological or social consequences of their consumptive practices. At the same time, actor-networks have mobilised market controls and incentives to transform effectively the behaviours of other actor-networks in the *Toothfish Market Sub-network*. For example, certain aspects of economic globalisation have been used to resist IUU activities, as exemplified with the widespread mobilisation of intermediary actor-networks (for example: communication technologies, consumer campaigns and trade data analysis) by NGOs to extend their global actor-networks and raise issues of sustainability in the Southern Ocean fisheries. More specifically, ENGOs have urged consumers to act at a distance and modify their own behaviour to ensure that the fish products they purchase are sourced only from legitimately licensed and sustainably managed fisheries. In this respect, the globalisation of trade information and data associated with the toothfish has acted as an agent of change at a distance and created new forms of knowledge that cross territorial boundaries and social structures. In

addition, traditional notions of the State and sovereignty, and the continuing transformation in the structure and functions of the global toothfish economy have transformed the role of state actor-networks and created new spaces for non-state actor-networks. Thus, the *Patagonian Toothfish Network* has extended to include intermediary and sometimes hidden actor-networks groups such as NGOs, independent scientists, financial clusters, media conglomerations, traders, restaurateurs, chefs, consumers, artists/writers and other community assemblages. They mediate between society and the individual, and represent a plurality of actor-networks that influence State-led management and conservation strategies.

Overall, power is mobile in the *Patagonian Toothfish Network*; it constantly shifts between governments, fishers, scientists, NGOs, traders and increasingly consumers and members of the general public. With this in mind, brief summaries of the major events leading to state and non-state actor-networks entering the Patagonian toothfish debate, and international developments and the influence of state and non-state actor-networks that are leading to a more sustainable Patagonian toothfish fishery are detailed in Appendix C Tables C1 and C2. The summaries illustrate that internationalism prevails in the actor-network where the management, conservation and protection of the toothfish increasingly depends on there being no *others*, but on mobilising a global and connected community in a free flowing actor-network that strives toward the same moral persuasion. However, if individuals are to be encouraged to modify their behaviours and act on their own conduct, self-managing local *centres of calculation* are also required (see Callon 1986; Dean 1999; Fox 1999; Murdoch 2000). Making these centres accountable rests on State-led authority mobilising meetings and groups in their own sub-networks, whose identities and livelihoods are more entwined with specific fisheries or trade transactions about which they have knowledge. These localised centres then need to be linked by intermediary actor-networks and *punctuated* into the wider *Patagonian Toothfish Network* to mobilise action internationally and across spatial scales.

The investigation also revolves around how intermediary actor-networks influence models of organisation, which create their own nodes in the *Patagonian Toothfish Network*, to make them more legitimate and efficient (Section 1.4.2). For example, the allocation of property or access rights (that advocate economic efficiency and can be freely transferred in markets) represents a movement on the state-market axis. Alternatively, by moving from direct regulation to consultation and then co-management strategies to manage Patagonian toothfish stocks, the option of decentralisation, delegation and participatory democracy represents a movement on the state-community axis (Figure 10.1). On the community-market axis, the global economy and the choices that traders and consumers make to purchase only toothfish products that have been caught from legitimately licensed and managed fisheries can have impact upon what toothfish products are supplied in the marketplace. Importantly,

the convergence (or *punctualisation*) of these models is mobilised by differing power relations (see Jentoft 2005). For instance, fishers are able to mobilise property rights and exert power by lawfully excluding other human actor-networks from the toothfish fisheries, and co-management shares power among various human actor-networks who collectively decide on toothfish fishery management arrangements. Flexible specialisation utilises personal capacity to exert power by promoting market choice and self-government that can be made calculable and manipulated by working on the spaces within which it is exercised.

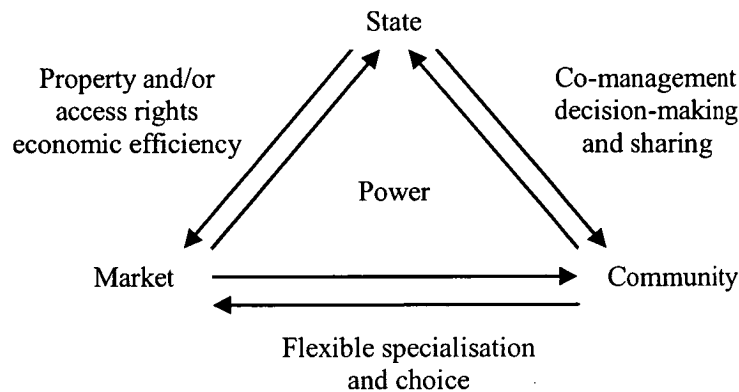


Figure 10.1: Principles of organisation in the toothfish fisheries

However, conflicts emerge along the state-market axis in respect to the growing inability of national governments to discipline the activities of trans-national fishing companies or allocate and enforce SFRs and ITQs to accommodate the demands of industry operators. Problems can also be extended to the state-community axis and community-market axis. Public participation is especially problematic when resource management is at stake because it is the vehicle by which issues of intra- and inter-generational equity are debated (see Fallon & Stratford 2003a). For example, it may give affluent toothfish consumers great comfort to boycott the purchase of toothfish products on the presumption that their actions may positively affect conservation outcomes so that future generations of humans are able to have, as part of their stock of natural assets, a diverse and healthy Southern Oceans ecosystem. But their actions for the future may have unintended consequences in the present, such that the loss of valuable markets could seriously and negatively affect licensed fishers and communities whose members depend on the toothfish. Alternatively, trade in toothfish products may become hidden (or converse) as operators unload their products elsewhere.

Nonetheless, new possibilities emerge. For example, *technologies of agency* that embody co-management and consider moral discourses (as well as interest-driven and scientific discourses) re-embed toothfish management decisions back into local communities and deregulate sole power to science, policy and expert knowledge. Co-management and moral discourses are important to achieving inclusive decision-making because expert knowledge can be uncertain, incomplete and biased; objectives can be

ambiguous, conflicting and unstable; decisions can be challenged; and power can remain fragmented. For example, I drew upon the Australian experience and illustrated that consultation and co-management is an established strategy to manage the Australian toothfish fisheries in a reflexive way. Management of the Patagonian toothfish in this context appears as a stabilised actor-network where nature and society have been transformed and redefined. Relationships are firmly institutionalised, power-sharing and partnership are driven from the top, different levels of authority are integrated into decision-making, and negotiations tend to be consensual rather than confrontational. The overall success of the Australian SouthMAC and CCF meetings in governing these fisheries at a distance highlights that *technologies of agency* that comprise skills-based management advisory committees and seek to include all stakeholders (rather than those based solely on government and/or industry representation) can be successful if rendered calculable by *technologies of performance*. Nonetheless, this approach is a corporatist system in that industry operators are accorded a central and inside position in the toothfish decision-making management actor-network, are treated as partners and expect to be heard.

Therefore, complex issues arise when exploring the possibility of diverse human actor-networks working together successfully to manage and conserve toothfish stocks. Complex issues arise because actor-networks work within their own historical and political frameworks where self-interest and conflict of interests can override attempts to protect, equitably allocate the fisheries or regulate trade activities in a sustainable way. In addition, the fishing industry is mainly driven with short-term economic interests by IUU fishers and with longer-term economic interests by licensed fishers. However, economics alone cannot govern the fate of these fisheries. Despite this premise, and given that fishers seek a return on their investment, unless stakeholders can work together to find genuine partnerships and new solutions for managing and conserving toothfish, these fisheries may not survive.

Some lessons can be drawn from the Australian toothfish fishery management experiences that can be applied to other fisheries around the world, particularly with regard to applying a co-management approach. However, it is also important to recognise the success of other coastal States in managing their own toothfish fisheries. CCAMLR members have also been successful in developing an ecosystem management approach to fisheries management, applying a precautionary approach to decision-making and developing conservation measures that have been achieved through successful cooperative efforts and a high level of scientific integrity. These are all elements that might be useful to manage and conserve other fisheries. At the same time, each fishery is different in terms of historical precedence, political realities, legal controls, international conventions, commercial operations, and conservation requirements. Therefore, each fishery needs to be assessed on its own merits. Conversely, it may not be possible to assess each fishery in isolation because each is

part of the conglomerate that comprises the *Global Fish Network* and all needs to be managed as a global ecosystem. Despite this tension, a key lesson from the Patagonian toothfish fisheries is that management and regulation need to be developed and implemented when a new fishery commences and before harvesting pressures and rogue activities are evident. Ultimately, if co-management arrangements are to be fostered, Borrini-Feyerabend (2000) considers that partnerships need to be harnessed where stakeholders recognise each other's different values, interests, and concerns; are open to various types of entitlements that go beyond the ones legally recognised (including fishery access rights or State mandates); seek transparency and equity in management decision-making; and allow members of the general public to assume important roles and responsibilities such as supporting sustainable fishery management initiatives and compliance operations or purchasing sustainably harvested toothfish products.

10.2 Further research agenda

The implications, assertions and speculations that arise from this investigation are far-reaching and centre on strong and adaptive management, robust science, effective fisheries compliance, trade control and willingness to cooperate. One conclusion that can be drawn is that insufficient attention has been paid to multi-level governance arrangements and complementary action at varying spatial scales aimed at managing resident, trans-boundary, straddling, highly migratory, and high seas toothfish stocks that act in a dissident manner and defy jurisdictional constraints. Multi-level governance arrangements implies that CCAMLR needs to remain non-discriminatory, open to new members, and based on equitable distribution of fishing resources if the stocks are to be collectively managed.

Developing strong, adaptive and multi-level fisheries management that incorporates a transparent and collective management decision-making framework supported by all stakeholders' is one significant research agenda that emerges from this investigation. Some respondents asserted that building such a framework might include a commitment to advancing precautionary and ecosystem-based management for the Southern Ocean in accordance with the Convention on the Conservation of Antarctic Marine Living Resources, ATS and LOSC. Other core issues centred on encouraging States to become parties to relevant instruments such as the UN Fish Stocks Agreement and Compliance Agreement, and developing a governance framework and *Global Oceans Policy* at the international level; adaptive and flexible co-management arrangements at the national level; and managing trans-boundary toothfish stocks from a regional ecosystem perspective whilst taking into account FSUs that are shared by more than one State. Additional issues included supporting bi-lateral and multi-lateral allegiances and combining limited resources to assist in management efforts; extending the Convention on the Conservation of Antarctic Marine Living Resources to include Patagonian toothfish stocks found both inside and outside the Convention Area; allowing only those

States that are party to the Convention to fish in the Convention Area; and advantaging the efforts of licensed fishers and vessels that perform the best.

This investigation also revealed that scientific uncertainty and risk characterise the management of toothfish stocks. Nonetheless, given that science continues to triumph over other forms of knowledge in the *Patagonian Toothfish Network*, many respondents focused on extending research efforts that promote robust scientific understandings about the biology of the toothfish and its place within the ecosystem in an effort to determine accurate stock assessments. For them, a holistic, transparent, harmonised and flexible scientific approach is needed that fosters shared meanings and understandings, incorporates uncertainty and risk and is independent of political agendas. More specifically, they called for CCAMLR and its members to assess fishing activities before opening new fisheries; and ongoing research to improve fishing procedures and technologies and stop destructive fishing practices. Respondents also supported advancing the CCAMLR *Scheme of International Scientific Observation*. For the respondents, observers provide invaluable research into the fisheries and are able to identify gaps in the data because they talk directly to the fishers, relay industry information back to CCAMLR members, and foster cooperation between the fishing industry and government authorities.

An important focal point for the respondents centred on research and management action directed towards effective fisheries compliance. Given that relatively low fines and the confiscation of rogue vessels has not deterred IUU operators, and the moral, legal and political responsibilities with regard to vessel ownership and flagging remain problematic, many respondents proposed effective fisheries compliance that includes strengthening national legislation and surveillance and enforcement capabilities. They also supported assessing the performance of flag and port States; strengthening and committing resources to the voluntary *International MCS Network*; and implementing national and international plans of action on IUU fishing. Some respondents recommended specific research into determining whether extra-territorial application of domestic criminal and civil sanctions and applying retrospective legal action can be enacted against IUU operators. In addition, other respondents suggested that LOSC be reviewed to establish whether legal action (possibly stronger penalties or custodial sentences) can be taken against non-party, third party or non-complying States to the Convention on the Conservation of Antarctic Marine Living Resources in an effort to increase the seriousness with which international fisheries offences are viewed; or whether a test case could be brought before the International Tribunal for the Law of the Sea against a FOC vessel to deter other vessels and States from not effectively discharging their obligations. In particular, some respondents also saw merit in reversing the burden of proof (where operators prove their fishers' and vessels' innocence) on those seeking to access the toothfish fisheries and registering vessels on whitelists or involved in court actions. With these agenda in mind, many respondents

called for more transparency and publicly available information on the beneficial ownership of vessels to establish genuine links between the flag State and the vessel registered to fly its flag, vessel history and employment conditions prior to CCAMLR and State authorities permitting access to the toothfish fisheries.

Emerging research agenda formed around understanding the global nature of toothfish trade, making trade information publicly available; and what actions could be taken by state and non-state actor-networks to implement effective trade controls to exclude IUU operators from the marketplace. One such approach involved evaluating the effectiveness of the CCAMLR CDS and eVMS, and reviewing the Commission's inspection and surveillance capabilities to increase the number of CCAMLR and national at-sea vessel inspections (including the inspection of mother ships and trans-shipment vessels) and ensure the legitimacy of toothfish catches and transport. Indeed, trans-shipment vessels posed specific concerns for many respondents and they suggested that operators be required to obtain appropriate authorisation to offload and trans-ship toothfish products to ensure that IUU catches are not laundered outside the Convention Area and beyond the control of CCAMLR and national governments. They also strongly supported all vessels accessing or servicing the toothfish fisheries carrying a eVMS, and all toothfish products that are trans-shipped, landed in ports, imported, exported, re-exported and traded being accompanied by completed and validated eCDS documentation.

Other research agenda that emerged included educating traders and consumers about the environmental consequences of their purchasing decisions; evaluating the merit of developing toothfish certification and eco-labelling to distinguish between legitimately licensed and illegally harvested toothfish; possibly listing the toothfish under CITES Appendix II and developing environmental rules-based standards and sanctions in the WTO to help curb IUU trade activities.

Notably, this investigation revealed that CCAMLR members, national governments, scientists, industry operators, NGOs, traders and consumers are all part of the problem and solution to managing and conserving the Patagonian toothfish in a sustainable manner. With this in mind, an important conclusion that emerged hinged on strengthening actor-networks between all stakeholders at multiple levels to ensure that knowledge is retained within these networks, but also to ensure that opportunities for new knowledge are captured and enrolled. In particular, some respondents stressed that dialogue and cooperation need to be fostered in a culturally sensitive way using diplomacy and moral persuasion to build trust, reduce political tensions and/or conflicting impasses, and encourage conformance and compliance with conservation measures and regulatory controls. They called for a review of the CCAMLR consensus decision-making process to consider whether different decision-making procedures (such as majority vote) or implementing dispute-resolution mechanisms might achieve more binding outcomes and improved performance. Some respondents advocated

capacity-building between stakeholders that focuses on technical cooperation, flexibility to tailor cooperation and consensus on a case-by-case basis, co-management, and a central repository for information held by CCAMLR. However, they also suggested that CCAMLR members look to other RFMOs as a guide, and determine how strategic links with other organisations (such as the ATS, CITES, IMO, OECD and WTO) might be formed to ensure effective, complementary, equitable and improved outcomes; and speculated that a GFMO might promote the global integration of RFMO arrangements and increase cooperation between IGOs.

Concealed research agenda also arose in this investigation. For example, understanding the social dimension of IUU fishing and how social and economic drivers fuel IUU activities emerged as important but little understood issues. In addition, insufficient attention has been paid to legally protecting vulnerable fishers onboard IUU vessels such as enforcing internationally agreed labour standards and working conditions as mandatory criteria to access the toothfish fisheries. Other hidden research agendas included assessing over-capacity in the toothfish fishing industry; investigating the possibility of farming toothfish to determine its technological, ecological and economical viability, and potential to reduce fishing pressure on wild stocks; and establishing broader conservation objectives for the Southern Ocean ecosystem, including the establishment of an adequate and representative system of MPAs for the region. Some respondents also speculated that establishing ecosystem reference areas and conducting marine environment reporting might provide mechanisms to understand the broader affects of climate change and how it might impact upon the resilience of the Southern Ocean ecosystem and the toothfish to adapt to environmental change. Finally, the intrinsic values of the Patagonian and Antarctic toothfish and how these species are of value in and of themselves, irrespective of their social, environmental, or economic significance to humans continue to be poorly considered.

10.3 Final remarks

Under some circumstances, non-state actor-networks can be a decisive influence forcing a change upon state actor-networks acting together to manage the international Patagonian toothfish fishery. In particular, NGOs have arguably played a constructive role in broadening effective action against IUU Patagonian toothfish activities. However, they have not solved the problem in their own right. It is through the combined action of other actor-networks, including CCAMLR and its members, concerned/responsible fishing States, licensed fishers, together with the associations and sub-networks they have formed, that has led to developing new ways to manage the toothfish fisheries. However, if the sub-networks that have cohered around their OPPs and shared visions are to remain stable, they need to deliver demonstrable outcomes for the Patagonian toothfish. Paradoxically, the ability of the Patagonian toothfish to draw a wide ambit of actor-networks into a heterogeneous, dynamic and unbounded *Patagonian Toothfish Network* is potentially a weakness because the actor-network's

sheer complexity may result in a lack of clear purpose, direction and commitment of those seeking to manage and conserve the fisheries.

Nonetheless, and to the credit of those involved with CCAMLR, its members have acted quickly to develop ecosystem management and controls to stop IUU fishing. They are striving to embrace a widening constituency, have invited a number of NGOs to attend Commission meetings as observers, do appear to listen to NGO concerns and acknowledge the need for discussions to be more open and transparent. In this regard, two important questions emerge in the *Patagonian Toothfish Network*.

1. *Where we would be without CCAMLR in a large IUU fishery where ecological, moral and legal norms are challenged, and secrecy, ruthlessness and self-interest prevail?*
2. *By discrediting the efforts of CCAMLR members, could some actor-networks be advancing their own self-interests?*

While these are important questions to ask, the toothfish fisheries would be under greater pressures had not CCAMLR and its members taken action to stop IUU fishing. Moreover, respondents in this investigation have not sought actively to discredit the efforts of CCAMLR members, but question the possibility of CCAMLR and its members doing better in terms of improving performance and collaboration between all stakeholders; and taking into account the intrinsic value of the Patagonian toothfish, and political, scientific, technological, economic and social changes.

This investigation also highlighted that many actor-networks have not sought actively to discredit the efforts of NGOs, but question the possibility of these organisations working more cooperatively with other stakeholders. In addition, this investigation described NGOs more broadly than simply environmental organisations (ENGOS) and included other INGOs such as regional toothfish industry bodies, as exemplified by COLTO and SARPC, and globally focused industry associations such as ICFA. Adding to these complexities, is the power that ENGOS and INGOs mobilise when they consult with IGOs such as the IUCN, UNEP and IMO. In this vein, I speculate that continued and close working relationships between the legitimately licensed toothfish industry and ENGOS are likely to provide significant input to managing and conserving the toothfish fisheries in a more sustainable manner considering that until now, state actor-networks have been unable to stop IUU fishing for the Patagonian toothfish and associated trade activities.

Moreover, licensed fishers reveal significant depth to their industry knowledge regarding the management and conservation of the Patagonian toothfish. They emphasise that resolving the fishing activities that are negatively affecting the Patagonian toothfish fishery is a major challenge for all stakeholders. Significantly, they warn that the oceans will no longer provide the entire world's fish requirements and

aquaculture is unlikely to be capable of supplying sufficient seafood products to meet consumer demand. They also acknowledge the need for self-management to ensure that the toothfish fisheries are managed sustainably in terms of environmental protection and economic profitability. Notably, the overall philosophy and working model of COLTO demonstrates that a framework can be developed for fishing industry input into the management and conservation of a commercial fishery.

Overall, managing the ecosystem, which comprises the natural *Southern Ocean Sub-network* and the Patagonian toothfish it captures, in a sustainable manner involves the social. In this respect, human actor-networks interconnect with one another and other actor-networks in a socio-natural-material actor-network and make judgements about how Patagonian toothfish resources might be used. Although scientific or ecological knowledge may inform the development of precaution, environmental limits, and TACs set by CCAMLR members and national governments to ensure that toothfish stocks persist, other values emerge such as understanding issues of supply and demand and production and consumption, and how social systems put pressure on individuals and groups to act in ways that do not respect limits or that jeopardise ecosystems. In short, the biophysical, socio-economic and cultural implications of using Southern Ocean resources set the political climate within which ecosystem/human system management strategies operate.

Tensions between and among diverse interests are likely to increase as Patagonian toothfish products become more valuable and less available, procedures and technologies to harvest toothfish stocks become more sophisticated, and access to the fisheries becomes more competitive. Overall, the dilemmas faced by those managing the Patagonian toothfish fishery illustrate how the interaction between politics, science and principled beliefs influence the way in which actor-networks associate with one another and their willingness to accept new norms. CCAMLR and State activity are not separate or immune from global economic (market) and social (community) dynamics. Trade-offs between hierarchy and participation, politics and science, and intra-generational equity and provisioning for the future are at the centre of the conflicts in relation to the toothfish fisheries that, at face value, appear to be about rational use rather than human or ecological well-being. However, given that the oceans and high seas belong to the commons, sustainably managing the toothfish fisheries rests on moving from ideas of ownership by communities of interest, narrowly circumscribed by sovereignty or association with business, to ownership as stewardship. In this context, the global community cares for regions that are common property for the benefit of humanity, and for the benefit of nature and the ecosystems on which its members depend. Sustainably managing the Patagonian toothfish fishery is also about social norms, changing cultural perceptions and imperatives and appealing to the general public's moral sense of *doing the right thing* in a world where individuals are more informed about the environmental consequences of their actions.

No *magic bullet* emerged in this investigation to solve all the problems in the Patagonian toothfish fishery and it will take a combination of strategies and actions that are underpinned by good science depending on the dynamics of each fishery, where fishers are based and where fish is landed and traded. Reconciling disjunctures in the *Patagonian Toothfish Network*, and fostering new partnerships between CCAMLR members and national governments; coastal, fishing, FOC, port and market States; the *global civil society*; and existing international regimes were also prominent themes. At a minimum, the maintenance of the Patagonian toothfish and the ecosystem requires vertical and horizontal *integration* of policy; the exercise of *precaution*; and high levels of *ecological and social literacy and knowledge* (see Fallon & Stratford 2003a). This requirement is not abstract, but materially affects all actor-networks. It also demands respectful and non-discriminatory *public participation* at various levels of government and governance, and at various spatial scales. As Dean (1999: 26) explains, “government is accomplished through multiple actors and agencies rather than a centralised set of State apparatuses” where any *a priori* notions of power and authority are rejected. Therefore, CCAMLR and national governments embody mobile, changing and contingent assemblages between state and non-state actor-networks, and between public and private spheres. As such, trade-offs will need to be made between increasing the social and economic costs of cooperation and enforcement to manage the Patagonian toothfish fishery and reducing the environmental and social costs of IUU activities. Ultimately, whether the focus is on managing and conserving the Patagonian toothfish fishery, other global fisheries or the ecosystem, this investigation reveals that the key to sustainability rests with building a more inclusive actor-network. In such an actor-network, individuals are connected with one another and encouraged to monitor their own behaviour and risks to cooperatively share resources for the collective good.